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USER SUPPORT APPARATUS AND SYSTEM USING AGENTS

RECEIVED

BACKGROUND OF THE INVENTION   MAR 1 5 2002

Technology Center 2100

1. Field of the Invention

[0001]   The present invention relates to a technique for supporting Internet users [in an electronic manner. This invention]: particularly [relates to] an apparatus and [a] system for [supporting users by] providing information [necessary for the users employing agents] employing a virtual agent.

2. Description of the Related Art

[0002]   Since [the] Internet access [at] from home has [been common recently] become widespread, the number of Internet Web [WWW (World Wide Web)] users [are] is growing rapidly. As it is convenient for [the] users [at home] to access [to] from their home a huge [amount] body of information from all over the world, the number of users is further increasing.

[0003]   [Now users can believe] Users know that almost all [the necessary] desired information exists somewhere in the huge number of [web] Web sites. The number of [web] Web sites or pages, however, has become too large for users to easily reach the information they [need] seek although they know that the information exists somewhere [in] on the [web sites] Web.

[0004]   Portal sites with search engines [who are aware of the above situation] have [been trying hard to sophisticate] provided more sophisticated search

methods [by, for example,]. For example, by making information hierarchical [with the help of the portal sites], users can efficiently find necessary information out of the flood of information available using search conditions or formulas, including logical OR and logical AND in each topic area predefined by the portal

5   sites.

[0005]   [It becomes, however, extremely] However, it becomes somewhat difficult for [general] average users to use highly complicated [and], logical search formulas in today's environment [where] as most of the [web] Web users population [is] are unsophisticated beginners. The problem [is becoming to be]

10   becomes more difficult as the hierarchy of information becomes deeper, and the classification of information [is] has become too complicated to be [instantly] easily understood. The [amount of] large volume of available information [will spoil the] continues to make utilization of the information more difficult as the number of sites is still increasing, and more and more beginners are coming [in]

15   into the [web] Web world.

[0006]   It is therefore an object of the present invention to help computer users reach information they need from the Web in a friendly virtual environment. It is another object of the present invention to provide a technique for supporting users to smoothly conduct operations [in] using computers and

20   other devices.

SUMMARY OF THE INVENTION

[0007]   According to one aspect of the present invention, [a] the user support apparatus [is provided. The apparatus] comprises an agent storage means and an agent output unit. The agent storage means stores data [of] for a first agent

5   [being dedicated to a user serving] based on user information [of the user], and data [of] for a second agent [being] based upon an expert [of] in a specific area[, whereas the]. The agent output unit [outputs] provides data from the first and second agents [derived from said data] either visually or audibly to the user.

[0008]   In this configuration, the first agent [gives] provides a selection guide

10   to the second agent when the second agent selects information necessary for providing [the] a service. The process of [giving] providing the guide is conducted visibly from the user.

[0009]   The first agent therefore reduces user operation as it acts [on] with the second agent for the user. [Another advantage is that] In this manner, the user

15   [can] is able to understand [that] the direction of the [job] process being [done] performed by the second agent.

[0010]   The process of [giving] providing the guide to the second agent is [realized] just for [showing it to] informing the user. It is therefore not necessary for the first agent to actually [give] provide the guide to the second agent inside

20   the apparatus. System designers can easily understand it is more convenient to provide or design an agent manager to manage the first and second agents

collectively [instead of] rather than designing the two agents independently. In this sense, the agent manager controls the first agent and second agent as "puppets" inside the apparatus, and the guide given from the first agent to the second agent is controlled by the agent manager outputting images and/or

5   audio data to the user. [Even such] Such a case is still, however, described herein as "the first agent [gives] provides a guide to the second agent" [in this specification].

[0011]   The apparatus may further comprise an interface through which the user inputs an instruction. The second agent may select [the] information by

10   putting higher priority on the [inputted] input instruction than the [given or presented] guide [from] provided by the first agent. In this configuration, the user can modify, cancel or change the guide given by the first agent[,] as he/she [wants] desires. The interface may comprise a user interface by which the user can input necessary instructions, and a request [inputting] input unit provided

15   [in] by the agent manager for accepting requests from the user.

[0012]   According to another aspect of the present invention, [a user support apparatus is provided. The] the apparatus comprises a front processor [which] that works at a user interface level, and a middle processor [which] that handles and stores data to be presented to the user via the front processor. The front

20   processor comprises an agent storage means [which] that stores the data [of] for a first agent [being dedicated to the user serving] based on user information [of the user], and data [of] for a second agent [being] that is an expert [of] in a

specific area. The first and second agents are designed in such a manner that [the first agent,] when the second agent requests the middle processor <u>to</u> provide information [necessary to serve] <u>requested by</u> the user, presents a selection guide to the second agent based on the user information in [the] <u>a</u>

5   manner that the user can [recognize the presentation of the guide] <u>easily</u> <u>understand</u>.

[0013]   The front processor [may have] <u>has</u> a functional [block] <u>system</u> to [make] <u>allow</u> the user <u>to</u> interact with the apparatus, realized by software, hardware or any combinations of the two. In this configuration, the middle

10   processor serves [for the user] as an information accumulator and manager, and can provide information necessary for [the user] more [efficiently] <u>efficient</u> <u>operation</u> in general. ["]The middle processor["] does not [necessary] <u>necessarily</u> assume the existence of a back processor or any other processors.

[0014]   According to still another aspect of the present invention, <u>another</u>

15   <u>embodiment of</u> a user support [apparatus is provided. The apparatus] <u>system</u> comprises a front processor [which] <u>that</u> works at <u>a</u> user interface level<u>,</u> and a back processor [which] <u>that</u> acquires <u>external</u> data to be presented to the user [from outside]. The back processor [may comprise] <u>includes</u> an agent [providing unit which] <u>that</u> sends [said] <u>the external</u> data to the agent storage.

20   In this configuration, [also] the first and second agents collaborate in an aforementioned manner. The back processor [may acquire] <u>acquires</u> the latest agent data and information [necessary] for the user from, for example, arbitrary

[web] Web sites connected to the Internet. Here, the ["]back processor["] does

not [necessary] necessarily assume the existence of the middle processor or

any other processors.

[0015]   The back processor [may function] functions as a server for serving

5   the agent data to the front processor via the Internet or any other network[s].

The server can be configured in various manners such that the main functions

remain at [a] the server side like CGI [or] (Common Gateway Interface), the

main functions are transferred to the client side like a Java (trademark) applet or

Active X (trademark), and an API [or] (Application Program Interface) type

10   where the main functions are provided at both the server and client sides like a

Java application.

[0016]   In [this] such a configuration, the agent storage means may store a

local agent [which] that has existed in the front processor without information or

data provided from the back processor, and a remote agent [which] that has

15   come to exist provided from the back processor. The local agent is convenient

in that it is generally easily customized in each apparatus and is available even

when the apparatus is in an off-line state. The remote agent on the other hand

is convenient in that it can be sent from the user to a plurality of apparatuses

and is generally easily updated or registered at the server end. The local agent

20   and remote agent may be provided to the user in such a manner that the user

cannot distinguish them so that a seamless environment may be provided.

[0017]   According to still another aspect of the present invention, <u>another</u> <u>embodiment of</u> a user support [apparatus is provided. The apparatus] <u>system</u> comprises memory, program modules loaded [on] <u>in</u> the memory and a CPU to execute the <u>program</u> modules [which]<u>. The program modules</u> may include

5   functions of executing a first agent and a second agent, the first agent being represented as a character to bridge <u>between</u> the user and the [apparatus] <u>system</u> and to serve the user in a user-dependent manner based on information of the user, and the second agent being represented as a character to bridge <u>between</u> the user and the [apparatus] <u>system</u> and to serve the user <u>as an</u>

10   <u>expert</u> for a specific area [as an expert thereof]. In this configuration, [the first agent,] when the second agent selects information necessary to serve the user, <u>the first agent</u> presents a selection guide to the second agent based on the user information whereby the user can [recognize[]] <u>understand</u> the presentation of the guide.

15   **[0018]**   According to still another aspect of the present invention, [a user support apparatus is provided. The] <u>the</u> apparatus comprises an agent storage [which] <u>that</u> stores data of a first agent and a second agent [which] <u>that</u> bridge a user and the apparatus<u>,</u> and an agent output[s] unit [which] <u>that</u> outputs the first and second agents [derived from said] data. The first and second agents are so

20   designed to collaborate while having [conversion] <u>conversation</u> or dialog recognizable from the user when the user requests a given or arbitrary service. The conversation may show the process to optimize the service for the user. The user [can] <u>will be able to</u> understand the process from the conversation.

[0019]   According to any one of the aforementioned aspects, a user-friendly

agent can let the user know the processes conducted in the apparatus so that

the user can judge whether the processes are correctly performed for him/her.

[0020]   The middle processor may comprise a meta-information generator

5   [which] that generates meta-information by analyzing a page [which] that is a

[collective] collection of data necessary for the user and [which] that is provided

from the back processor, and a write controller [which] that stores the page and

the meta-information in a local memory device by associating them. ["]Meta-

information["] corresponds to the information with regard to the page [after], with

10   ["]meta-data["] meaning "data with regard to data".

[0021]   In this configuration, the page and meta-information are combined,

one being embedded in [another] the other, or the two being linked to be

associated [with] together. The combination is then stored in a local memory

device. The user can roughly understand or search the content or subject of

15   the page using the meta-information. The page can be retrieved from the local

memory generally faster than a global search as long as the page exists in the

local memory or a cache memory.

[0022]   The meta-information generator may further comprise a keyword

detector to detect keywords in [the] a Web page, a subject analyzer to analyze

20   the subject intention, purpose or theme of the page, and a meta-information

extractor to extract meta-information from the page based on the theme as

analyzed. The extracted meta-information is stored in the memory device associated with the page.

[0023]   The meta-information generator may further comprise a pre-check unit to judge whether the <u>Web</u> page is a desired page based on the detected

5   keywords. When the page is not a desired page, the page may not be stored in the memory device. [Contrarily] <u>Alternatively</u>, the page may be stored in the memory device when the page is judged to be the desired one.

[0024]   The middle processor may comprise a cache search unit. The cache search unit may judge whether the desired page already exists in the local

10   memory device by matching the keywords with the meta-information stored in the memory device. The cache search unit may instruct to read the page from the memory device when the page is judged to exist in the memory and may instruct to retry [search] <u>searching</u> for the page when it is not judged to exist in the memory. A page found by the retry search may be [inputted] <u>input</u> to the

15   meta-information generator, and the meta-information generated may be associated with the page and [is] stored in [the] memory.

[0025]   The middle processor may further comprise a search pre-processor to support the search conducted by the back processor by manipulating the keyword reflecting the intention of the user in a predetermined manner. The

20   search pre-processor may comprise a condition adding unit to add a keyword [which] <u>that</u> is made objective based on the intention of the user assumed from

the <u>initial</u> keyword reflecting the intention of the user [and]<u>. A</u> search condition

setting unit [to] <u>may</u> set a search condition or formula including, for example, a

logical OR in accordance with the original keyword and the added keyword.

The added condition may be reflected in the guide given from the first agent.

5   **[0026]**   The middle processor may further comprise a pre-search controller to

predefine information the user may [inquire,] <u>require</u> based on the personal

information of the user. In this configuration, the middle processor may instruct

the back processor to search, while the apparatus is not used by the user, for

the assumed or anticipated information without an [expressed] <u>express</u>

10   instruction from the user. Pages thus acquired may be stored in the memory

device together with the meta<u>-</u>information so that the response to the user's

future request is improved.

[0027]   In one aspect of the present invention, the middle processor is

implemented in a home server and the front processor is implemented in a

15   device controlled by the home server. The front processor may present the

operational information of the device, [for example,] <u>such as</u> control or status

information of the device<u>,</u> to the user and the middle processor may manipulate

or improve the operational information and send it to the front processor.

[0028]   In another aspect of the present invention, the back processor may be

20   implemented in a server on a network, [for example,] <u>such as</u> in a [web] <u>Web</u>

server. And the front processor may be implemented in a device, [for example,]

such as a PC, or a mobile terminal such as a mobile phone, [which] that can access to the server. The front processor may accept a request for indicating information from the user, and the back processor may acquire the requested information from an arbitrary information source on the network and send it to

5   the front processor.

[0029]   According to still another aspect of the present invention, a user support [apparatus is provided. The apparatus] system comprises an agent controller [which] that provides an agent to support a user, a request analyzer [which] that analyzes a request input from the user, and a response controller

10   [which] that presents [to the agent controller] necessary information for the requested service to the agent controller when the service has been judged processible, and otherwise records the requested service as an [unattained] undeciphered service. The [apparatus] system may further comprise a communication unit [which] that electronically reports the recorded [unattained]

15   undeciphered service to the administrator of the [apparatus] system.

[0030]   The ["]request["] may have a specific purpose such as "Teach me how to operate a PC" or may simply be a chat [just like "Hallo"] request such as "Hello" to [have] initiate a dialog with an agent. In this sense, ["]necessary information["] may relate to the operation of a PC or to utterance data

20   corresponding to each scene. "Utterance" in this specification refers not only to actually [uttered] spoken words but also inputted text-based requests/responses to/from the agents and the like.

[0031]   There are at least two cases where the service is judged not

processible. In the first case, the request could not be analyzed or

interpreted[,]: whereas, in the second case, information to respond to the

request could not be found even though the request itself was properly

5   interpreted. There are at least two cases where the information [could] might

not be found. In the first case, the information could not be found inside the

apparatus[,]: whereas, in the second case, the information could not be found

even after the search was conducted outside the apparatus. [Contrarily] On the

other hand, the service is judged processible when the request is understood or

10   interpreted and necessary information to cope with the request exists. A series

of processes to handle the request is performed in an electronic manner and

the term "understand" or "interpreted" is not necessarily used in the sense that a

human can understand the request.

[0032]   There are at least two meanings of the phrase "recording the

15   requested service as an [unattained] undeciphered service" in this specification.

In the first meaning, the [unattained] undeciphered service is recorded with an

identifier while storing all the requests in a log file. In the second meaning, only

the [unattained] undeciphered service is recorded when it is detected.

[0033]   According to still another aspect of the present invention, a user

20   support [apparatus is provided. The apparatus] system comprises an agent

controller [which] that provides an agent to support a user, a conversation or

dialog data storage means [which] that stores conversations [to be] held

between the user and the agent, [an] a request analyzer [which] that analyzes a request input [from] by the user, a response controller [which] that determines a response to the request based on result of the analysis, and a log storage means [which] that stores the log of conversation actually held between the

5   user and the agent. The response controller presents to the agent controller necessary information, read from the conversation data storage means, for the requested service when the service has been judged processible and otherwise records in the log storage means the requested service as an [unattained] undeciphered service.

10   [0034]   [The] A ["]response["] can be made regardless of whether the service is judged processible or not. [An] For example, an agent can "apologize" to the user when the service is judged not processible. In [this] such a case, a front-end process [works] operates to apologize to the user, and a back-end process works to record the [unattained] undeciphered service so that the system

15   [improvement] may improve on conversation data, using an algorithm for analyzing the request and the sophistication of information search necessary for the service to become possible.

[0035]   According still another aspect of the present invention, a user support [apparatus is provided. The apparatus] system comprises a first processor

20   [which conducts an] that manages agent-level control and a second processor [which conducts a] that manages character-level control. The first processor comprises a total system manager [which provides a field for] that enables a

plurality of agents to interact and manages the agents, and a plurality of agent

controllers, each of which, through a character, acquires and interprets a user

request so as to realize substantial functions of a respective agent. The second

processor comprises a character manager [which] that provides basic functions

5   to visually represent interaction between [the] a plurality of agents at the

character level[,] and a plurality of character controllers, each of which

corresponds to one of the agent controllers, and provides a series of character

actions to the corresponding agent controller for use therein. Interface between

a ["]horizontal["] function between the plurality of agents [which] that is provided

10   by the total manager and the character manager[,] and a ["]vertical["] or [an]

individual function provided by an agent controller and the character controller[,]

is predetermined for the plurality of agent controllers and the plurality of

character controllers.

[0036]   In [this] the present apparatus, the total support manager and the

15   character manager have a function [which works] that operates on a plurality of

agents simultaneously. These managers therefore have a horizontal function to

explicitly or implicitly [work] operate on a plurality of characters. On the other

hand, the [gent] agent controller and the character controller have a vertical

function [which works] that operates on a specific individual agent. The

20   interface between the horizontal and the vertical functions is standardized,

which makes it possible to add a vertical function or an agent-dependent

function later according to the interface. The interface allows [to design]

designing new agent-dependent functions so that the agent system is easily modified and improved.

[0037]   Characters can interact, for example, appear on the same screen and talk with each other as the interface absorbs the difference of the input/output formats of the characters. Conventionally, agents developed in different companies usually cannot communicate with each other. The present apparatus, however, realizes [the] such communication by implementing agents obeying the interface. Based on this feature, a new and improved type of agent system is provided.

[0038]   According to still another aspect of the present invention, a client-server system using a character to support a user [is provided. In this system, the client] comprises a first processor [which conducts an] that manages agent-level control and a second processor [which conducts a] that manages character-level control. The first processor comprises a total system manager [which] that manages a plurality of agents to achieve interaction therebetween[,] and a plurality of agent controllers, each of which, through a character, acquires and interprets a user request so as to realize substantial functions of a respective agent. The second processor comprises a character manager [which] that represents the interaction between the plurality of agents at the character level[,] and a plurality of character controllers, each of which corresponds to one of the agent controllers and provides a series of character actions to the corresponding agent controller for use therein. In this system, the

server, collaborating with the client, interprets the user requests and presents [to the client] information necessary to respond to the request to the client.

[0039]   The server may further comprise a control window manager [which] that provides functions of the total manager and the character manager to the

5   client. The server here may be any element, component, module, unit, device and the like [which] that can provide a service to the client. The server may comprise a plurality of expert or specialized servers, each of which, for service in specific areas, provides functions of the agent controller and the character controller to the client.

10   [0040]   According still another aspect of the present invention, a user support method using a character [is provided. The method] conducts agent-level control and character-level control. The agent-level control method provides a total management process to manage a plurality of agents to achieve interaction therebetween and a plurality of agent control processes, each of

15   which responds to a user request via a respective character. The character-level control method provides a character-control process to represent the interaction between the agents at the character level and a plurality of character-control processes, each of which corresponds to one of the agent-control processes and provides a series of character actions to the

20   corresponding agent-control process. The interface between a horizontal function among the plurality of agents and a function individual to each agent is predetermined for the plurality of characters.

[0041]   According to still another aspect of the present invention, a user

support [apparatus is provided. The apparatus] system comprises a user

utterance identification block [which] that comprises an electronic user utterance

list holding assumed or anticipated utterances and identifies a user utterance

5   when it is inputted, a plurality of response blocks, each of which makes one of

the agents being designed to have a respective specific area, respond to the

inputted utterance when the utterance is included in the specific area assigned

to the agent[, and]. The system further comprises a registration unit [which] that

[stores] collects in a storage region provided for each specific area a network

10   address of [an web] a Web site according to a request [of] from the user.

[0042]   The ["]action["] of an agent may be an imitated utterance, an image, a

behavior [and] or any other activities to be performed to support the user. In

this sense, the action may relate to any process element or process flow. The

[e] ["]storage region["] relates conceptually to a [conceptually] single physical

15   entity to classify the network addresses of [web] Web sites as bookmark

information. The region, however, is not necessarily a single physically

continuous area. The storage region works as a folder to classify files. A single

folder may have subfolders in it so that the bookmark information may be

layered.

20   [0043]   The response block [may] comprises a search unit [which] that

searches a [web] Web site [having] containing information desired by the user

[therein]. The registration unit stores the network address of the searched [web]

Web site to a storage region assigned to the response block having the search unit [which] that conducted the search.

[0044]   The apparatus [may] further comprises a display unit which presents registered [web] Web sites classified to the storage regions.

5   [0045]   According to still another aspect of the present invention, a user support system [is provided. In this system,] comprising a plurality of user support apparatuses are connected to the network as independent nodes. Each apparatus has its own specific area of expertise. Each apparatus stores a respective response block while having the utterance identification block

10   [commonly] in common with other apparatuses. The identification block is stored in one of the apparatuses. In this configuration, the apparatus containing the identification block [in it] may act as an entrance or portal server [which] that can specify all the user utterances processible in the system. Based on the [specified] specific user utterance, a suitable apparatus may be selected. The

15   system efficiency [can] may be improved as the system load is distributed by assigning the identification of the user utterance and the response from an agent to a plurality of nodes.

[0046]   In [this] another aspect of the system, the user-utterance collection may be provided by a library providing unit to any developers who wish to use

20   the collection. The library providing unit may transmit the collection in an off-line or on-line manner. Off-line distribution may be realized with a normal mail.

For on-line distribution, a server managing the user-utterance collection [therein] may be provided. The use right of the library site is then licensed. In the user-utterance collection, a general utterance library recording general utterances of users [in a library] described in natural languages may be

5   licensed. According to this license scheme, a third party can develop its own user-utterance collection and an agent-action collection independently to realize its own user support apparatus, which may eventually improve[s] the functionality of the entire user support system.

[0047]   According to still another aspect of the present invention, a user

10   support [apparatus is provided. The apparatus] system comprises a user-utterance identification block [which] that comprises an electronic user-utterance list [holding] containing assumed or anticipated utterances and identifies a user utterance when it is inputted[,] and a response block [which] that has an electronic agent-action library to respond to the utterance and

15   [which] makes an agent respond to the utterance[,]. The system also comprises a search item holder [which] that acquires and holds in advance items of information the user wishes to search[,] and a search unit which conducts searches for the items. The user-utterance identification block further comprises an additional-utterance list containing utterances for which the

20   search unit is [planed] planned or programmed to start the search. The search unit starts [the] a search when the user utterance is detected contained in the additional-utterance list.

[0048]   The contents of the additional_utterance collection may be included in

the user_utterance collection so that the user_utterance collection may have the

contents of both [of] the additional utterances and user utterances [in this

apparatus]. In this configuration, a user utterance can be searched in the user_

5   utterance collection and the additional_utterance collection simultaneously.

[0049]   The search unit may start the search spontaneously without an

instruction from the user. In this configuration, a quick response can be realized

when the user requests [a] certain information as the search for similar

information has been conducted [beforehand] in the past. The searched

10   information may be presented to the user without a user request. The search

may be performed periodically or [in] during hours when the network is not

busy.

[0050]   In this apparatus, each field of information may be associated with a

character. The apparatus may further comprise a character display unit [which]

15   that presents to the user results of the search in the form of an utterance of a

character [which] that is associated with a field to which the search result is

classified. In this configuration, the character appears to search for the

information spontaneously so that a [friendlier] user-friendly environment [can

be] is provided.

20   [0051]   In this apparatus, the search item holder may further comprise a

bookmark holder which stores the network address of a [web] Web site. The

search unit acquires [update] current information of the [web] Web site. The character display unit presents [the user] the [update] current information to the user in the form of an utterance of a character when a [web] Web site [which] is classified to a field with which the character is associated.

5   [0052]   The present invention has been summarized according to several aspects thereof. These aspects are, however, only examples and further embodiments, [arbitrary] combinations [of the above aspects or the elements therein are also effective] and enhancements are also described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

10   [0053]   Fig. 1 is a block diagram of the user support apparatus according to Embodiment 1.

[0054]   Fig. 2 is another block diagram of the user support apparatus according to Embodiment 1.

[0055]   Fig. 3 is still another diagram of the user support apparatus according

15   to Embodiment 1.

[0056]   Fig. 4 is still another diagram of the user support apparatus according to Embodiment 1.

[0057]   Fig. 5 illustrates the configuration of the apparatus shown in Fig. 1.

[0058]   Fig. 6 shows the internal structure of the agent storage in the front

processor.

[0059]   Fig. 7 shows the internal structure of the agent manager in the agent

storage.

5   **[0060]**   Fig. 8 is an information table generated as a subset of the personal

information database to be referred to when a recipe is presented to the user.

[0061]   Fig. 9 is a block diagram of the meta-information generator in the

middle processor.

[0062]   Fig. 10 illustrates a meta-information file generated in the middle

10   processor.

[0063]   Fig. 11 shows a collection of the meta-information file and page data.

[0064]   Fig. 12 shows the meta-information file and page data associated with

each other using link information.

[0065]   Fig. 13 illustrates the structure of a search pre-processor in the middle

15   processor.

[0066]   Fig. 14 is a reference table provided in the search pre-processor of the

middle processor.

[0067]   Fig. 15 is a [flowchart] flow chart showing the process to read a target page from the cache memory or to store the page in the cache memory.

[0068]   Fig. 16 is a [flowchart] flow chart to acquire beforehand a page which the user may need.

5   **[0069]**   Fig. 17 illustrates a screen which first appears when the user uses an agent.

[0070]   Fig. 18 illustrates a screen on which a recipe agent is called by a user-dedicated agent.

[0071]   Fig. 19 shows the result of the initial search by the recipe agent.

10   **[0072]**   Fig. 20 shows the result of the secondary search by the recipe agent.

[0073]   Fig. 21 is a [flowchart] flow chart for a service to be performed when the user issues a request.

[0074]   Fig. 22 illustrates the configuration of an apparatus according to Embodiment 2.

15   **[0075]**   Fig. 23 is a [flowchart] flow chart showing the process to initiate an agent in Embodiment 2.

[0076]   Fig. 24 illustrates the interaction between the user and the agent in Embodiment 2.

[0077]   Fig. 25 illustrates the interaction between the user and the agent in Embodiment 2.

5   **[0078]**   Fig. 26 illustrates the interaction between the user and the agent in Embodiment 2.

[0079]   Fig. 27 illustrates the interaction between the user and the agent in Embodiment 2.

[0080]   Fig. 28 illustrates the interaction between the user and the agent in
10   Embodiment 2.

[0081]   Fig. 29 illustrates the interaction between the user and the agent in Embodiment 2.

[0082]   Fig. 30 is the internal block diagram of the log storage.

[0083]   Fig. 31 shows an [unattained] <u>undeciphered user</u> request list.

15   **[0084]**   Fig. 32 shows the configuration of a client-server system according to Embodiment 3.

[0085]   Fig. 33 shows the structure of a control window management site according to Embodiment 3.

[0086]   Fig. 34 shows the structure of a chat server according to Embodiment 3.

5   [0087]   Fig. 35 shows the structure of an index file contained in the chat server.

[0088]   Fig. 36 shows the structure of an assumed utterance collection contained in the chat server.

[0089]   Fig. 37 shows the structure of an access information file contained in

10   the chat server.

[0090]   Fig. 38 shows the structure of an action file contained in the chat server.

[0091]   Fig. 39 shows the structure of a user terminal which is a client machine.

15   [0092]   Fig. 40 illustrates a chat agent which appears when the user terminal is initiated.

[0093]   Fig. 41 illustrates a recipe agent which appears together with the chat agent when the user asks about recipe.

[0094]   Fig. 42 illustrates the dialog held between the chat agent and the recipe agent.

5   **[0095]**   Fig. 43 illustrates a scene where the recipe agent presents the search result to the user.

[0096]   Fig. 44 shows a scene where a third agent or a travel agent appears to respond to the user.

[0097]   Fig. 45 shows the entire structure of a network system including a user

10   support system according to Embodiment 4.

[0098]   Fig. 46 shows the structure of an originating server included in the user support system.

[0099]   Fig. 47 shows the structure of the user-utterance collection contained in the originating server.

15   **[0100]**   Fig. 48 shows the structure of an access information file contained in the originating server.

[0101]   Fig. 49 shows the structure of a bookmark file contained in the originating server.

[0102]   Fig. 50 shows the structure of a gourmet server contained in the user support system.

5   **[0103]**   Fig. 51 shows the structure of a user terminal used in the user support system.

[0104]   Fig. 52 illustrates a local agent which appears when the user terminal is initiated.

[0105]   Fig. 53 illustrates a chat agent which appears when the user speaks.

10   **[0106]**   Fig. 54 illustrates a gourmet agent which appears when the user asks a question regarding a Peking ravioli restaurant.

[0107]   Fig. 55 illustrates a screen where the gourmet agent presents the search result to the user.

[0108]   Fig. 56 illustrates a screen where a registered bookmark information is

15   presented to the user.

[0109]   Fig. 57 shows the internal structure of the originating server.

[0110]   Fig. 58 shows the internal structure of an additional index file.

[0111]   Fig. 59 shows the internal structure of an additional[user]-utterance collection.

[0112]   Fig. 60 shows the internal structure of the gourmet server.

5   **[0113]**   Fig. 61 shows the internal structure of the favorite data.

[0114]   Fig. 62 shows the structure of a page stored in the agent action library.

[0115]   Fig. 63 shows the screen displayed based on the page.

[0116]   Fig. 64 shows the screen in which the favorite register accepts the registration of a bookmark from the user.

10   **[0117]**   Fig. 65 shows the screen in which a favorite character registered by the user is displayed.

[0118]   Fig. 66 shows the screen in which Gourmet Agent presents the search result.

DETAILED DESCRIPTION OF THE INVENTION

[0119]   The invention will now be described based on the preferred

embodiments, which do not intend to limit the scope of the present invention,

but exemplify the invention. All of the features and [the] combinations [thereof]

5   described in the embodiments are not necessarily essential to the invention.

Embodiment 1

[0120]   A user support apparatus according to [embodiment] Embodiment 1

supports a user employing two types of agents. The first agent [or] (a user-

dedicated agent) provides services to [the] a user [in] on a user-friendly one-to-

10   one [relation] relationship [with the user to be friendly to the user]. The second

agent [or] (an expert agent) has its own specific area of expertise, such as

information search and so on, responsive to [the] a user's request.

[0121]   The [first] user-dedicated agent generally has more opportunities to

[contact the] interface with a user and accumulates [the] personal information

15   [of] specific to the user, such as purchase records, [food] preferred foodstuffs,

[hobby] hobbies, health condition and so on. The [first] user-dedicated agent

presents a guide to the expert agent for [the] a particular user when the expert

agent acts for [the] that user.

[0122]   When [the] a user, for example, requests the movie expert agent to

20   recommend new arrivals, the [first] user-dedicated agent, knowing the user's

preference as ["]horror["] and ["love] romantic comedy["], may [utter] display on

the screen, "Let us know very horrible ones" or "Try to find [lovely] <u>romantic</u> and

funny ones". Then the [second] <u>expert</u> agent may respond, "Trust me. Wait for

a moment."

[0123]   From the conversation between the agents, the user can understand

5   the search process is conducted properly. The more precisely the [first] <u>user-</u>

<u>dedicated</u> agent can convey the feeling of the user, the more the user feels

[convenient] <u>comfortable</u> with the [first] <u>user-dedicated</u> agent. The user may

feel <u>a degree of</u> intimacy with the [first] <u>user-dedicated</u> agent [as] <u>similar to</u> a

virtual pet. The more [intimately] <u>comfortable</u> the user feels with the [first] <u>user-</u>

10   <u>dedicated</u> agent, the [more easily] <u>easier</u> the [first] <u>user-dedicated</u> agent can

collect the personal information of the user as a general tendency. The image

or [any other] appearance of the [first] <u>user-dedicated</u> agent may be selected <u>or</u>

<u>designed</u> by the user [or may be designed by the user].

[0124]   The purpose of the present embodiment is almost achieved if the

15   conversation between the agents is funny. In conventional search methods, for

example, "Now searching. Please wait for a moment" or the like may be

displayed but the user is not saved. According to the present embodiment, the

agents can give a relaxation to the user, while the user is waiting for the search

result, by playing a comic chat. The agents are [mainly described] <u>shown</u> in

20   Figs. 6 to 8 and [Fig.] 17 and <u>will be described in further detail</u> later <u>in this</u>

<u>specification</u>.

[0125]   Figs. 1 [to] through 4 illustrate various types of user support

apparatuses according to the present embodiment. In any case, the apparatus

comprises [an arbitrary] various combinations of a front processor 12, a middle

processor 14 and a back processor 20, which are the three major processing

5   units. The front processor 12 interacts with the user. The middle processor 14

supports the front processor 12 [behind it] and acquires and stores necessary

information in the format the user needs. The back processor 20 collects

necessary information from the Internet and provides it to the middle

processor 14. The back processor 20 [further, as a server,] also provides

10   expert agents as described [later] herein to more efficiently support the front

processor 12.

[0126]   In Fig. 1, the user support apparatus comprises the front processor 12

and the middle processor 14 implemented [in] on a personal computer (PC) 10.

The apparatus may include the back processor 20. It should be noted that the

15   degree of freedom to combine the processors is high. The middle processor 14

communicates with the back processor 20 implemented [in] as a [web] Web

server 18 via the Internet 16.

[0127]   In Fig. 2, the front processor 12 is implemented in a home electric

appliance 30 and the middle processor 14 is implemented in a home server 32.

20   The middle processor 14 communicates with the back processor 20,

implemented [in the web] as a Web server 18, via the Internet 16. The home

appliance 30 may be an audio[-]visual appliance; such as a digital television set,

a VCR [and] <u>or</u> a digital camera. The home appliance 30 may <u>also</u> be a traditional appliance, such as a refrigerator [and a] <u>or</u> washer, or may be any other <u>electrical</u> appliance[s], including a home security appliance having sensors. [In any case, the] <u>The</u> home appliance 30 is managed by the home

5   server 32. The front processor 12, for example, manages information displayed on a LCD panel provided on a refrigerator, obtains <u>a</u> user's instruction with regard to the [icebox] <u>refrigerator</u> and informs the user of the condition of the [icebox] <u>refrigerator</u>. The middle processor 14, on the other hand, may display "today's recipe" and other information [which] <u>that</u> is beyond the normal

10   operational information of the refrigerator.

[0128]   In Fig. 3, the front processor 12 is implemented in a mobile terminal 40, such as a cellular phone, and the middle processor 14 and the back processor 20 are both implemented in the [web] <u>Web</u> server 18, where the mobile terminal 40 and the [web] <u>Web</u> server 18 communicate via the

15   Internet 16. In this configuration, the middle processor 14 is also implemented in the [web] <u>Web</u> server 18 and the mobile terminal 40 is comparably easily realized in a small body of the terminal.

[0129]   In Fig. 4, the configuration is almost the same as Fig. 3, but only the back processor 20 is implemented in the [web] <u>Web</u> server 18. The middle

20   processor 14 is [skipped] <u>omitted</u> to provide a simplified service.

[0130]   Fig. 5 is a block diagram of the user support apparatus according to the configuration shown in Fig. 1. The PC 10 may be a normal computer and comprises a [PCU] CPU, memory and program modules to support users loaded on the memory. The blocks [here are drawn in terms of] in Fig. 5 depict

5   functions characteristic [to] of the present embodiment and [the] those skilled in the art [can] understand the functional blocks can be [realized with] embodied as hardware only, software only or any [other] combination[s] of the two.

[0131]   [The] As shown in Fig. 5, the front processor 12 and the middle processor 14 are implemented in the PC 10. The back processor 20 is

10   implemented in the [web] Web server 18. The PC 10 and the [web] Web server 18 communicate via [the] an electronic, such as the Internet network. [In Fig. 5, the middle processor 14 and the back processor 20 are drawn closely, but in reality, the Internet 16 exists between the two.]

[0132]   The front processor 12 has a user interface or UI 100 allowing the

15   user to input [the user's] instructions and to conduct any other user-related matters. The UI 100 may comprise [an] input devices such as a keyboard and a mouse, a display device such as a computer monitor to display information to the user, and graphical user interface (GUI) applications and other programs.

[0133]   An agent storage device 104 [has] stores object data describing

20   agents to support system users. The object data may be hereinafter simply referred to as "the data" or "the agent data". An agent output unit 102 outputs

the agents to the user via the UI 100, including both the [first] user-dedicated and [the second] expert agents.

[0134] The [first] user-dedicated agent is [user-dedicated and is] provided by an agent providing unit 134 for each user in order to obtain [the] personal

5   information [of the user. The personal information], which is used for customizing services conducted by the [second] expert agent. The user-dedicated agent has a function to chat with the user to acquire the personal information. The function is [made active] activated when the user-dedicated agent [has been] is frequently used by the user. For example, the user-

10   dedicated agent is switched to a "friend" internally when the number of contacts between the user and the user-dedicated agent reaches a predetermined value.

[0135] The second type of agents are experts for [each] various specific areas; such as cooking, movies, travel, PCs, new products and shopping. The [second] expert agents conduct information searches and provide [desired]

15   requested information to the user.

[0136] From a different criterion, the agents [are] may be classified [to] as ["]local agents["] and ["]remote agents["]. The local agents are originally held by the front processor 12 in a local environment and provide guidance information concerning the PC 10 to the user. The local agents may be [realized with]

20   created using the functions of the [OS] operating system of the PC 10, with the functions of application programs implemented in the PC 10, or with other

functions. The local agents and the remote agents may be designed in such a manner that the user cannot distinguish them.

[0137]   The remote agents are provided by the agent providing unit 134. [The remote agents] They may [stay] remain in the agent storage 104 after being

5   downloaded [to the agent storage 104], or may be deleted from the agent storage 104 after the session between the PC 10 and the [web] Web server 18 is finished. The user may select whether the remote agents should [stay] remain or should be deleted. Here, the remote agents are mainly described although the user-dedicated agents and the expert agents may be local.

10   **[0138]**   An agent processor 106 conducts necessary processes when the user issues an instruction to any one of the agents via the UI 100. The agent storage 104 and the agent output unit 102 work as a mechanism to output the agent to be [shown] displayed to the user, [whereas] and the agent processor 106 works as a mechanism to input user instructions to the agent and

15   to send the instructions to the middle processor 14.

[0139]   When the user asks an expert agent to provide information, the agent inquires the necessary information to the middle processor 14 reflecting a guide given from the user-dedicated agent. The middle processor 14 reads necessary information from a cache memory 120 [when it is stored in the

20   memory 120], if present, and sends it to the expert agent. [When] If the necessary information is not stored in the memory 120, the middle processor 14

instructs the back processor 20 to acquire the necessary information from an

arbitrary site on the Internet 16 and to send it to the middle processor 14.

Information thus obtained via the Internet 16 is hereinafter referred to as a

"page" after the file format of HTML. The middle processor 14 modifies the

5   page sent from the back processor 20 to store in the cache memory 120 for

future use, while also providing it to the user.

[0140]   A search unit 130 of the back processor 20 searches for the page

requested [from] by the middle processor 14 via a communication unit 132. The

search unit 130 may be a meta-search engine which can conduct searches

10   simultaneously using multiple search engines existing outside the apparatus. In

that case, the search process is generally more efficient and reasonable.

[0141]   An agent controller 140 of the agent providing unit 134 generates and

manages remote agents and provides them as object data to the front

processor 12. The object data includes image data, chat data and other

15   attribute data to provide characters to the remote agents. When the user gives

a task to an agent in the front processor 12, the task is [obtained at] processed

by the agent controller 140 and necessary action, such as a search, is fulfilled.

[0142]   A user information [DB] database 150 stores the personal information

of the user obtained through questionnaires, chats with agents and other routes

20   in order to provide information [to] fit to the user preferences and to more

efficiently customize the functions of the user-dedicated agents.

[0143]   Fig. 6 illustrates the object data developed inside the agent

storage 104. An agent manager 500 manages expert agents 504 including the

user-dedicated agent 502 and a recipe agent 506. The user-dedicated

agent 502 is a "chat agent" whose main function is to chat with the user. Now

5   the recipe agent 506 is described as an expert agent. The agent manager 500

controls the actions and conversation of the agents by selecting [necessary

chat] appropriate dialog data [and the like] from a dialog data storage 508, and

by sending the data to the agent.

[0144]   Fig. 7 illustrates the internal structure of the agent manager 500. A

10   request input unit 510 acquires a user request via the UI 100. The acquired

request 518 is sent to a keyword extractor 108, which extracts keywords in a

manner to be described later in the specification.

[0145]   The extracted keyword 522 is sent back to a guide presenting unit 512

of the agent manager 500. The unit 512 obtains user information from a

15   personal information [DB] database 118 and generates a guide 524 which

[should be given] is passed from the user-dedicated agent 502 to the recipe

agent 506.

[0146]   The generated guide 524 is sent to a search pre-processor 110 and a

dialog processor 514. The search pre-processor 110 sets a search condition or

20   formula taking the guide 524 into consideration. The dialog processor 514

extracts from a dialog data storage 508, based on the guide 524, conversation

data which the user-dedicated agent 502 [should] utters and [another] other

conversation data which the recipe agent 506 [should] utters to respond to the

user-dedicated agent 502[, and sends the data]. The extracted conversation

data is sent to the user-dedicated agent 502 and recipe agent 506, respectively.

5   The agents utter the conversation data.

[0147]   The user may enhance, modify or [deny] reject the guide 524 and

input another instruction when the user-dedicated agent 502 shows the

guide 524 to the expert agent in a manner recognizable [from] by the user, for

example, by displaying on [the] a screen or by voice. The instruction from the

10   user is also [obtained] processed by the request input unit 510 and is

transmitted to the guide presenting unit 512 indicating that the instruction,

[which is] hereinafter referred to as a ["]priority instruction 520["], has higher

priority than the guide 524. The guide presenting unit 512 generates another

guide 524 in accordance with the priority instruction 520 and transmits it to the

15   search pre-processor 110 and the dialog processor 514. In this manner, the

service by the agents is [modified] controlled by the user.

[0148]   An agent introduction unit 516 functions to make the user-dedicated

agent 502 introduce expert agents, such as the recipe agent 506, to the user.

This function is initiated when the user-dedicated agent 502 calls an expert

20   agent suitable for the request of the user. The dialog processor 514 retrieves[,

from the dialog data storage 508,] conversation data from the dialog data

storage 508 necessary to introduce the expert agent. The retrieved data is

transmitted to the user-dedicated agent 502. The user-dedicated agent 502 introduces the functions and roles of each expert agent 504 to the user.

[0149]   Fig. 8 illustrates [a] an example subset 118a which [is] might be extracted from [a] the personal information [DB] database 118 to recommend a

5   recipe to the user under the collaboration of the user-dedicated agent 502 and the recipe agent 506. The subset 118a comprises a preference column 530, a column of recent meals 532, a health condition column 534, a column indicating the user's [unfavorite] least favorite foodstuff 536, a budget 'A' column indicating the acceptable budget for ordinary meals 538 and a budget 'B' column

10   indicating the acceptable budget for special [dinner] meals 540. [According to] As shown in Fig. 8, the user likes Chinese food. The user recently had Chinese (C), Chinese, Japanese (J), Chinese, Italian (I), Japanese, Japanese ... as his/her meal. The health condition of the user is generally good but the blood pressure is a little high. The user dislikes shellfish and onion. The budget A is

15   800 yen and the budget B is 2000 yen.

[0150]   In this circumstance, when the user inputs a request "Recommend a recipe", the request is [acquired] received by the request input unit 510 although the user believes that the request is accepted by the user-dedicated agent 502. The keyword extractor 108 extracts keywords such as "recipe", "recommend",

20   which are returned to the guide presenting unit 512. The guide presenting unit 512 generates a guide 524 such as "not salty," referring to the health condition described in the subset 118a. The guide 524 is transmitted to the

search pre-processor 110 [and is ANDed to the] to be included with keywords, described later, to limit the number of candidates to recommend.

[0151]   The guide 524 is also transmitted to the dialog processor 514. The user-dedicated agent 502, under the control of the dialog processor 514, talks

5   to the recipe agent 506 to indicate "Don't choose salty ones". By this time, the search pre-processor 110, knowing the guide 524, has prepared the actual search, which is executed by the search unit 130. The user-dedicated agent 502 shows the process to the user by the conversation with the recipe agent 506. The response of the recipe agent 506 may be simply [as] "Wait for a

10   moment". The response may be prepared such that it is independent [from] of the guide 524 given by the user-dedicated agent 502.

[0152]   The guide presenting unit 512 may detect, referring to the history column 532, that the user has recently had [so] many Chinese meals and may [make] cause the user-dedicated agent 502 to utter "Don't recommend Chinese

15   food", "Recommend Japanese or Italian food". In the same manner, the guide presenting unit 512 may [make] cause the user-dedicated agent 502 to utter, referring to the [unfavorite stuff] least favorite foodstuff column 536, "Avoid shellfish " and "Below 800 yen" referring to the budget A column 538.

[0153]   The guide 524 from the guide presenting unit 512 may be considered

20   when the search pre-processor 110 generates [the] a search condition. Otherwise, the guide 524 may be introduced when the search result by the

search unit 130 has too many hits, or when the search result contains too many

pieces of information the user [do not desire] did not request. The guide

presenting unit 512 [therefore] may therefore issue the guide 524 at [several]

various different [timings] times based on checking the search process or result.

5   **[0154]**   The guide presenting unit 512 may, for example, [makes] make the

user-dedicated agent 502 utter "You recommended the same recipe yesterday",

"Don't exceed the budget", "Avoid onion" when the search result is revealed

without giving the guide 524. In a background process, the guide presenting

unit 512 may generate the guide 524 in the form of keywords, such as "budget

10   below 800 yen", "NOT onion" to exclude "onion" in the search, and sends the

guide 524 to the search pre-processor 110. Receiving the guide 524, the

search pre-processor 110 creates a new search condition and sends it to the

search unit 130, which retries the search to find recipe information more

suitable for the user.

15   **[0155]**   The guide presenting unit 512 may generate many guides 524,

referring to the subset 118a, to limit the candidates when the search result

includes too many information items. The guide presenting unit 512 may [ask]

indicate to the user "We found too many items. Do you have any specific

preference?" to acquire more keywords when the search [result includes]

20   results in too many items even after the injection of many guides 524.

[0156]   The user, on the other hand, may input "I like Chinese food" when the user-dedicated agent 502 says "Don't recommend Chinese food" to the recipe agent 506. The [utterance] <u>interjection</u> of the user is handled as a priority instruction 520 and is provided to the guide presenting unit 512, which [initiates]

5   <u>would initiate a</u> search [over] <u>for a</u> Chinese recipe.

[0157]   The user-dedicated agent 502 may ask questions [to] <u>of</u> the user when the request inputted from the user is unclear. [The] <u>For example, the</u> user-dedicated agent 502 [may] <u>might</u> first ask "Which food do you prefer 1.Chinese 2.Japanese 3.Italian…?". The user-dedicated agent 502 [may] <u>might</u> then ask

10   "Which foodstuff do you [like] <u>prefer</u> 1.pork 2.meat 3.chiken 4.fish 5.vegetable …?" when the user [shows] <u>indicates</u> "1.Chinese" to the first question.

[0158]   The search by the recipe agent 506, which is in reality conducted <u>by</u> referring to the preference column 530, may take <u>some</u> time. The user-dedicated agent 502 may have conversation<u>s</u> with the recipe agent 506 to [give

15   a relaxation to] <u>create a relaxing environment for</u> the user. The user-dedicated agent 502 may start <u>a</u> conversation with the recipe agent 506 when the duration of the search exceeds a predetermined value. The duration may be measured by a timer<u>,</u> which is provided in the user-dedicated agent 502 or in any other part of the apparatus. The user-dedicated agent 502 (simply referred to as

20   "502" in the following conversation) may complain to the recipe agent 506 (simply referred to as "506") for the user as follows.

      (502) "Are you still searching! Are you really <u>a</u> professional?"

(506) "It's you who should help me if you have time to complain."

(502) "You always say 'Don't touch my job. I'm a professional.' Was it

a lie?"

(506) "I don't tell a lie except to my wife. That's why we can live

5   happily."

(502) "It is persuasive."

[0159]   Many dialog templates can be prepared beforehand[,] as scenes

where the agents [should give a relaxation to] may attempt to create a relaxing

environment for the user are limited to a few cases.

10   [0160]   In Fig. 5, the front processor 12 [can] may provide agent services to

the user with the help of the back processor 20. In that sense, the middle

processor 14 is not indispensable for the collaboration of the front processor 12

and the back processor 20. The middle processor 14, however, plays an

important role to more efficiently support the user by managing pages

15   requested by the front processor 12. The middle processor 14 is now

described.

[0161]   An agent processor 106 [acquires] receives a request inputted via the

recipe agent 506. The request generally takes [a] the form of a natural

sentence, such as "Let me know a good recipe [on] for meat". The user

20   naturally may input the request with independent keywords from the beginning.

It is assumed here that the user inputs a request with a natural <u>language</u> sentence.

[0162]   The keyword extractor 108, receiving the request, decomposes it to minimum units or words and extracts keywords, such as "meat", "food" and

5   "recipe", to reflect the intention of the user. The obtained keywords are hereinafter referred to as "initial keywords" to be distinguished from keywords given by the search pre-processor 110 described later.

[0163]   The initial keywords are transmitted to the search pre-processor 110. The search pre-processor 110 deletes unnecessary keywords and generates

10   more objective and suitable keywords, [which are] hereinafter referred to as "objective keywords", as the initial keywords [have] <u>may</u> not necessarily [been] selected to] be <u>determined as the</u> most suitable for the search. Keywords not [having been] deleted, [which] hereinafter referred to as "selected initial keywords", are then logically ANDed or multiplied with the <u>generated</u> objective

15   .keywords. The result [by] <u>of</u> the AND operation is then logically ANDed with the guide 524 endowed by the guide presenting unit 512 of the agent manager 500, and the final result is transmitted to the search unit 130 of the back processor 20 as a search condition in the form of a formula.

[0164]   The search unit 130 conducts <u>a</u> search over [web] <u>Web</u> sites and

20   pages using the search condition via the communication unit 132 and [the hit] <u>matching</u> information items, [which] hereinafter referred to as "target pages," are

obtained and sent to the agent controller 140 or directly to the agent

processor 106.

[0165]   The target pages are also sent to a meta-information generator 116,

which generates necessary meta-information and stores the information with

5   the target pages in the cache memory 120. The information stored in the cache

memory 120 is then [becomes ready] available for the user's future searches.

The cache memory 120 may be a disk type, semiconductor type and any other

type[s] of computer memory.

[0166]   The initial keywords extracted by the keyword extractor 108 are also

10   sent to a cache search unit 112. The cache search unit 112 searches [in] the

cache memory 120 using [the] keywords, such as "meat," and [reads] selects a

desired page[, which is already] stored therein while instructing the search pre-

processor 110 or the search unit 130 to stop the global search to the Internet.

The page thus obtained is displayed to the user via the recipe agent 506. When

15   the desired page[, on the other hand,] does not exist in the cache memory 120,

the global search through the search pre-processor 110 and/or the search unit

130 is executed.

[0167]   The personal information [DB] database 118 stores various

information regarding the user, including eternal information, such as [the]

20   preferences of meals and hobbies, and temporal information, such as [the]

recent meals of the user [had]. The personal information is generally acquired

through the agent processor 106 while the user is interacting with the user-dedicated agent 502. In another embodiment, the apparatus may comprise a schedule management function as a PIM or personal information manager, a health management function to calculate the calories of [the] meals[,] and an

5   accounting function to record the prices of goods the user purchased. The personal information may be obtained through such functions.

[0168]   A preliminary search controller 114 specifies information [in] which the user may be interested in based on the personal information stored in the personal information [DB] database 118, and sends keywords concerning the

10   specified information to the search pre-processor 110. The search pre-processor 110, triggered by the keywords sent from the preliminary search controller 114, generates the objective keywords and the search condition[,] by which the search unit 130 starts the search. The search process initiated by the preliminary search controller 114 may be preferably handled in a background

15   manner, for example, during nighttime when the user does not use the apparatus or during the daytime when the user does not input any instructions for a predetermined period. The process may be conducted when a mail program, not shown, establishes the connection with the Internet to download new e-mails. [In any case, as] As long as the search process is handled in a

20   background manner, the meta-information generator 116 [can] will have sufficient time for the processing.

[0169]   Fig. 9 shows the internal structure of the meta-information

generator 116. The target page sent from the search unit 130 is inputted to a

keyword detector 350. The detector 350 detects keywords from the target

page, analyzing the sentences and phrases contained in the target page. The

5   detected keywords, [which are] hereinafter referred to as "keywords for

checking", are transmitted to a pre-check unit 352.

[0170]   The pre-check unit 352 judges whether the target page is really a

page the user desires[,] based on the data stored in a check data storage 362.

The check data storage 362 stores frequent or important keywords for each

10   segmented subject. Similar to a portal site, the subject may be first roughly

classified into "news", "computer", "travel", "gourmet", "auction", "money",

"sports", "entertainment", "music" and "job". The "gourmet" may be subdivided

[to] as "restaurants", "events", "pro's recipe" "ethnic dish", "cooking programs",

"nutrition" and "special information". The check data storage 362 obtains

15   keywords by, for example, checking the pages of the sites registered in the

portal site according to each subdivided subject.

[0171]   The pre-check unit 352 judges whether each of the checking keywords

belongs to the above-mentioned subjects or subdivided subjects by matching

the keywords for checking and keywords stored in the check data storage 362.

20   The target page is judged to meet the user's purpose when many keywords for

checking belong to the subject "gourmet" and the initial keywords "meat", "dish"

and "recipe," which reflect the user's intention, belong to the same subject

"gourmet". Instead of the subject "gourmet", [the] a subdivided subject, such as "pro's recipe," may be used. In that case, the target page may be judged to be appropriate when, for example, 20% of the keyword for checking belong to "pro's recipe". The major function of the pre-check unit 352 is not to conduct a

5   rigid check, but to delete pages which are apparently away from the user's intention. In this sense, the judgment may be relaxed. The process result is sent to a meta-information write controller 360.

[0172]   A subject analyzer 354, which is [almost the same as] similar to the pre-check unit 352, acquires the keywords for checking from the keyword

10'   detector 350. The subject analyzer 354, however, does [not concern about] process the initial keywords, [and] but rather specifies a subject or a subdivided subject to which most of the keywords for checking belong. [When] For example, when "pro's recipe" is [for example] specified, the subject analyzer 354 [judges] would determine that the theme of the target page is

15   "dish", especially "recipe", which is conveyed to a meta-information extractor 356 and a meta-information presumption unit 358.

[0173]   The meta-information extractor 356 searches information concerning "recipe" in the target page and generates a file which is a collection of meta-data, [which is] hereinafter referred to as "meta-information file". Fig. 10

20   illustrates an example of the meta-information file 370. [In this file,] This file contains a template comprising items, such as "classification" and "name of

dish", in which necessary information pieces detected in the target page are embedded.

[0174]   The meta-information presumption unit 358 presumes meta-information for the items in the meta-information file 370 for which suitable

5   information has not been detected in the target page. For example, when "calories" in Fig. 10 is left unfilled, the presumption unit 358 may calculate the calories roughly referring to the items "material", "list of stuff" and "component". The equation to calculate the calories may be recorded in the presumption unit 358 together with the template. Besides the template for cooking, a

10   template for travel may be provided with the items "travel time", "travel fees" and "the sights to see". Meta-information may be picked up from digital maps, train schedules, travel guides of the area and so on which have been investigated beforehand when the information in the template for traveling is not found in the target page. When the user is interested in traveling, the preliminary search

15   controller 114 may obtain information to presume meta-information using maps and other various information available on the Internet. The pages containing the above-mentioned map information and so on may be stored in the cache memory 120 beforehand for future use [from] by the user.

[0175]   The meta-information file 370 generated by the meta-information

20   extractor 356 and reinforced by the meta-information presumption unit 358 is sent to the meta-information write controller 360. The controller 360, after the

approval by the pre-check unit 352, stores the meta-information file 370 and the

target page together in the cache memory 120.

[0176]   Fig. 11 illustrates the association of the meta-information file 370 and

a page data 372 of the target page. The content of the meta-information

5   file 370 is embedded in the header or any other portion of the page data 372.

The meta-information file 370 and the page data 372 may be combined in a text

file written in XML (Extensible Markup Language) as follows.

<recipe [mata] meta-information>

<URL>www.recipe.com</URL>

10   <classification>Chinese</classification>

</recipe meta-information>.

[0177]   Fig. 12 illustrates another combination of the meta-information file 370

and the page data 372. The meta-information file 370 and the page data 372

are generated independently and a link information 374 is recorded. In this

15   configuration, the cache search unit 112 conducts a search on the meta-

information file 370 and desired data is read from the cache memory 120

referring to the link information 374.

[0178]   Fig. 13 illustrates the internal structure of the search

pre-processor 110. The initial keywords extracted by the keyword extractor 108

20   are sent to a condition relaxing unit 400. The condition relaxing unit 400

determines which words [to] will be deleted, referring to a reference table 404.

The reference table 404 records keywords which are too strict or which reduce the number of hits too drastically. Such words can be identified based on the past search record. Such deleted keywords are hereinafter referred to as "invalid keywords". The condition relaxing unit 400 sends <u>the remaining</u>

5   <u>keywords or selected initial keywords</u> to a condition adding unit 402 and a search formula setting unit 406 [the remaining keywords or selected initial keywords. The invalid keywords are informed to the condition adding unit 402]. <u>The condition adding unit 402 is informed of the invalid keywords.</u>

[0179]   The condition adding unit 402 identifies the objective keywords <u>by</u>

10   referring to the reference table 404 using the selected initial keywords and/or the invalid keywords and sends the objective keywords to the search formula setting unit 406. The selected initial keywords are logically ANDed with the objective keywords and the result is then <u>logically</u> ANDed with the guide 524 sent from the guide presenting unit 512 in the search formula setting unit 406 to

15   obtain the search condition which is sent to the search unit 130.

[0180]   Fig. 14 illustrates the internal data of the reference table 404. The reference table 404 comprises a keyword column 440, a deletion column 442 and an objective keyword column 444. The keyword column 440 records the initial keywords. The deletion column 442 shows the invalid keywords with a

20   flag bit being "1". The selected keywords are shown with the flag being "0". The objective keyword column 444 shows objective keywords corresponding to

the initial keywords which are identified from the past search history or by an operator.

[0181]   Fig. 15 shows the process flow of the middle processor 14. The user first inputs a search request, such as "Let me know a recipe [on] for meat," to

5   the recipe agent 506. The request is acquired by the agent processor 106 (S10) and the initial keywords "meat", "dish" and "recipe" are extracted (S12). The initial keywords extracted are sent to the cache search unit 112, which conducts searches over the cache memory 120 (S14) and reads the desired page when it is [cached] found in cache (S14Y). The page is read and

10   displayed (S16).

[0182]   When the desired page is not cached (S14N), the search pre-processor 110 conducts the preprocess (S18) [through] by identifying the invalid keywords, endowing the objective keywords and setting the search condition reflecting the guide 524 sent from the guide presenting unit 512. The search

15   unit 130 searches [the] pages on the Internet (S20).

[0183]   The page found by the search or the target page is displayed as if it were found by the recipe agent 506 obeying the guide 524 from the user-dedicated agent 502 (S22). The target page is sent to the meta-information generator 116, which conducts the pre-check, the analysis of the subject, the

20   extraction and presumption of the meta-information. The meta-information is then generated as a file shown in Fig. 10 (S24). The meta-information is

associated with the target page in the manner shown in Figs. 11 or 12 and is

stored in the cache memory 120 (S26).

[0184]   According to the process flow shown in Fig. 15, information necessary

to the user is generally promptly provided based on a search request which is

5   [inputted] input by the user and which may be subjective to some degree while

the search process is being shown to the user. The desired page can be

appropriately searched when it is in the cache memory 120 as the meta-

information is added and cached. It is more probable, according to the present

embodiment, that the page read from the cache memory 120 meets the user's

10   intention. Caching efficiency is generally high as the meta-information

generator 116 pre-checks data to be cached.

[0185]   Fig. 16 illustrates the flow of the pre-search conducted by the

preliminary search controller 114 as a background process. The user records

his/her daily meals in the history column 532. [The] By referring to the personal

15   information, it can be determined that the user likes Chinese food (S30). The

preliminary search controller 114 expects an inquiry from the user concerning

the Chinese recipe when it [detects] determines that the user has not had

Chinese food for one week, and generates keywords such as "Chinese", "dish"

and "recipe" (S32).

20   **[0186]**   The preliminary search controller 114 [judges] determines the timing

for the background search has [come] arrived when it becomes midnight or the

like (S34Y) and sends the generated keywords to the search pre-processor 110. The process shifts to Fig. 15 via the route "A". According to this embodiment, the apparatus can be a highly customized agent machine to quickly respond to the user.

5   **[0187]**   The front processor 12, the middle processor 14 and the back processor 20 have been described. Now the service_s_ [actually] provided by the user-dedicated agent 502 and the recipe agent 506 [is] _will be_ described.

[0188]   Fig. 17 illustrates the initial screen 600 on the PC 10 [for] _displayed_ _for accessing_ the agent service. The user-dedicated agent 502 appears on the

10   screen 600 _as an illustrated character, for example,_ and says, "Hello, let's chat!". The user may input an instruction via [voice] _spoken command_. In Fig. 17, however, an input region 602 appears on the screen 600. The user inputs, _for example,_ "Recommend a recipe" in the input region 602. The request is obtained by the request input unit 510 and is processed in the aforementioned

15   manner.

[0189]   A new scene is created by the agent introduction unit 516 where the user-dedicated agent 502 introduces the recipe agent 506 to the user. Fig. 18 shows one preferred embodiment of the display scene. The user-dedicated agent 502 says "OK, I call Recipe Agent". The recipe agent 506 appears and

20   says "Trust me". The user-dedicated agent 502 then utters a guide 524 special to the user referring to the acquired request 518. In this example, the user is

suffering from anemia and the user-dedicated agent 502 says "Recommend a recipe good for anemia".

[0190] <u>Continuing the above example,</u> Fig. 19 illustrates the screen 600 when the recipe agent 506 [got] <u>gets</u> the search result based on the guide 524. The

5   recipe agent 506 says "I found" and several titles of the recommended recipes are displayed in a search result region 604 as "today's recipe<u>s</u>". The user-dedicated agent 502, detecting that the user has had Chinese food consecutively, gives a new guide 524 saying "Avoid Chinese recipe<u>s</u> today". By this time, the middle processor 14 or the back processor 20 may have started a

10 background process for the search avoiding Chinese food. In this case, however, the user inputs in the input region 602 "I prefer Chinese".

[0191] Fig. 20 illustrates the screen 600 after the secondary search based on the guide 524 is finished. The instruction [inputted] <u>entered</u> by the user has higher priority than the guide 524 from the user-dedicated agent 502 and the

15 search is limited [for the] <u>to</u> Chinese food. In this secondary search, the condition regarding the anemia and other conditions may be reflected. After the secondary search, the recipe agent 506 says "Here is a Chinese recommendation". The recommendation is displayed [on] <u>in</u> the search result region 604. The user-dedicated agent 502 says "Click here for more

20 information". The user can click the titles of the recipes to directly access [to] the related sites.

[0192]   In this example, the user requests a Chinese recipe even after he/she

has had Chinese dishes consecutively recently. After a series of search

[process is] <u>processes are</u> finished, the user-dedicated agent 502 may ask the

user "You have had Chinese food for three days. Are you really OK?". If the

5   user answers "Yes", the search condition concerning the frequency of the same

kind of food may be relaxed for the user.

[0193]   Fig. 21 illustrates the flow of the service provided by the agents. The

user initiates the initial screen shown in Fig. 17 (S50). When the user inputs a

request for service in the input area 602 via a keyboard or voice <u>recognition</u>

10   <u>system</u> (S52Y), the user-dedicated agent 502 calls and introduces an expert

agent suitable for the service (S54). The expert agent conducts the initial

search based on the request (S56) and displays the search result. The

guide 524 is [injected to] <u>included in</u> the search (S58) and the secondary search

is initiated (S60) to more properly find suitable information, which is <u>then</u>

15   displayed <u>to the user</u>. The user can input an instruction at any time during the

above steps to modify the service. The guide 524 may be [injected] <u>included</u>

when the initial search (S56) is started[,] to conduct the secondary search (S60)

from the beginning. If there are still too many hits in the secondary search, a

new guide 524 may be [inputted] <u>input,</u> or the user-dedicated agent 502 may

20   ask [a few] more questions to the user to finally [reach] <u>obtain</u> the necessary

information.

[0194]   The number of times the user [initiated] <u>initiates</u> the agent screen may

be recorded in the user information [DB] <u>database</u> 150 of the back processor

20. The user-dedicated agent 502 is programmed to passively listen to the

user's request until the number <u>of uses</u> reaches a predetermined value. The

5   user-dedicated agent 502 may ask questions more actively [on the] <u>concerning</u>

personal information of the user after the number <u>of uses</u> reaches the

predetermined value on the assumption that the user may allow such questions.

The user-dedicated agent 502 may, for example, ask "Where do you like to

go?", "How old are you?" and the like, and the answers to the questions may be

10   stored in the user information [DB] <u>database</u> 150 of the back processor 20 or

the personal information [DB] <u>database</u> 118 of the middle processor 14.

[0195]   Although Embodiment 1 has been explained with examples, it should

be understood that many [changes] <u>variations</u> and substitutions may be made

by those skilled in the art within the spirit and the scope of the present

15   [Embodiment] <u>embodiment</u>. A few such [changes] <u>variations</u> are now

described.

[0196]   The apparatus according Embodiment 1 may be provided with

functions for amusement. For example, the user can [get] <u>be awarded</u> points

when he/she makes access to the user-dedicated agent 502 or other expert

20   agents. The managing entity of the [web] <u>Web</u> server 18 may award a prize to

the user when the point <u>total</u> reaches a certain value so that the user is

encouraged to use the [web] Web site, which may [become more valuable] have residual value in terms of advertisement.

[0197]   "A premium agent" or a special expert agent may be secretly implemented in the apparatus to encourage the user to find the premium agent

5   for amusement or for [a present awarded] an awaard given by the site manager.

[0198]   Expert agents may be local agents.. A frequently asked questions (FAQ) expert agent or a mail expert agent may be implemented in the apparatus to help the user operate the apparatus. Local agents are advantageous in that they can work in an off-line environment.

10   [0199]   Each expert agent may have a function to record [the dialog it had] dialogs held with each user in the user information [DB] database 150 and a function to classify the user [to which] it is now serving [to] as a specific user type referring to the dialog recorded in the user information [DB] database 150. Expert agents [generally can more properly] are able to more efficiently respond

15   to the user after the user is classified [into] as a specific user type.

[0200]   In another embodiment, the user-dedicated agent 502 may [have a function to] record user requests in the user information [DB] database 150 and the back processor 20 may [have a function to] search other users who have similar preferences, behavior, [life style] lifestyles and the like with the present

20   user based on [the] past requests stored in the user information [DB]

database 150. The search unit 130 may push the same page to the meta-

information generator 116 of such users.

Embodiment 2

[0201]   [Designing virtual agents is difficult although users do not know the

5   effort of agent designers. Users expect the agents to understand their request

properly and to act immediately. It is however difficult to presume all the

various user requests and is still more difficult to predict how the users express

their request in words, phrases and sentences. Analysis of the request is a

hard task.]

10   [0202]   The present embodiment [aims to realize] will provide agents which

can flexibly respond to various requests from the users. [Another purpose of

the present embodiment is to provide a user support apparatus to more

precisely understand the request of the users. Still another purpose of the

present embodiment is to provide a user support apparatus which can improve

15   the preciseness of the understanding of the user requests.] Fig. 22 is a block

diagram of a user support system 1010 according to the present embodiment.

The entire configuration can be realized as a stand-alone apparatus. In another

embodiment, a back-end server may comprise arbitrary portions of the

apparatus, such as an agent controller 1012, a request analyzer 1014, a

20   response controller 1016, a dialog data storage 1018, a log storage 1020, a

search unit 1024 and an agent data storage 1034. When the server is provided

which supports several of these functional blocks, the remaining functional

blocks are implemented in the user apparatus which is a client machine. It

should be noted that there are many variations on how to assign the functional

blocks between the server and the client. Now, the user support system 1010 is

described with the assumption that it has all the functional blocks shown in Fig.

5   1 so that it may operate as a basic agent machine even in an off-line

environment.

[0203]   [Fig. 22 is a block diagram of a user support system 1010 according to

the present embodiment.]

[0204]   [The entire configuration can be realized as a stand alone apparatus.

10   In another embodiment, a back end server may comprise arbitrary portions of

the apparatus such as an agent controller 1012, a request analyzer 1014, a

response controller 1016, a dialog data storage 1018, a log storage 1020, a

search unit 1024 and an agent data storage 1034. When the server is provided

with a few functional blocks, the remaining functional blocks are implemented in

15   the user apparatus which is a client machine. It is noted that there are many

variations how to assign the functional blocks between the server and the client.

Now the user support system 1010 is described assuming that it has all the

functional blocks shown in Fig. 1 so that it can operate as a basic agent

machine even in an off-line environment.]

20   [0205]   The agent controller 1012 comprises an agent output unit 1030 to

display agents to a user and a request input unit 1032 to obtain the requests

given from the user to the agents. An agent data storage 1034 holds image data to display agents.

[0206]   The request analyzer 1014 performs voice recognition on the requests uttered by the user and transforms the voice input into the corresponding

5   sentence. The request analyzer 1014 then divides the sentence into independent words. For example, when the user utters "Good morning", the request analyzer 1014 divides the sentence into "Good" and "morning".

[0207]   The words thus obtained are sent to a response controller 1016, which determines the response of an agent [referring] referencing the keywords

10   "Good" and "morning" to a dialog data storage 1018. The dialog data storage 1018 stores conversation data the agent [should] uttered for each major keyword. The response controller 1016, for example, selects "Good morning. How are you?" as the response from the dialog data storage 1018 to answer the user's greeting. The response is sent to an agent output unit 1030, which

15   conveys "Good morning. How are you?" either by [the] action, by voice of the agent or by a [sentence] written statement.

[0208]   When the user makes a request, such as "Tell me the weather tomorrow," [makes] it becomes necessary to search for [a] specific information[, the]. The response controller 1016 transfers the keywords, such as "tomorrow"

20   and "weather," to a search unit 1024, which acquires weather forecast information via the Internet 1040. At the same time, a fixed sentence "It will be

... tomorrow" is read from the dialog data storage 1018, which is sent to the

agent output unit 1030 together with the information obtained via the

Internet 1040. The agent output unit 1030 may [utter] respond, for example, by

stating "It will be cloudy tomorrow" [to the user].

5   **[0209]**   The response controller 1016 [cannot] will not always understand the

user request. The response controller 1016 may not be able to find [a] suitable

conversation data in the dialog data storage 1018 when the user [inputted]

speaks or enters in an unexpected request. In such a case, the response

controller 1016 records the request as an [unattained] undeciphered user

10   request in a log storage 1020 and reads a formatted apology, such as "I'm

sorry, I cannot understand well," from the dialog data storage 1018 to [thereby]

send [it] to the agent output unit 1030 as an error handling process. The agent

output unit 1030 [utters] transmits the apology to the user. The minimum

information the log storage 1020 should record is the [unattained] undeciphered

15   user request. In Figs. 9 and 10 described later, all the interaction between the

user and the apparatus is recorded in the log storage 1020 as the history of the

interaction is sometimes useful in reality.

[0210]   A communication unit 1022 reads the [unattained] undeciphered user

requests from the log storage 1020 and sends them periodically to [an arbitrary]

20   a system manager, not shown, via the Internet [using an] via electric mail

[periodically or] when an [unattained] undeciphered user request occurs or

when the number of the [unattained] undeciphered user requests reaches a

predetermined value. The system manager may reside within the same site as

the user support system 1010. The <u>system</u> manager registers each

[unattained] <u>undeciphered user</u> request and its corresponding response to the

dialog data storage 1018 to thereby improve the function or performance of the

5   agents.

[0211]   Fig. 23 illustrates the flow of service performed by an agent in the user

support system 1010. When the user support system 1010 is powered on, the

agent output unit 1030 outputs an agent to the user (S1010). The request input

unit 1032 waits for a user request (S1012). When a <u>user</u> request is [inputted]

10   <u>received</u> (S1012Y), the request analyzer 1014 [decomposes] <u>parses</u> the

request into words (S1014). The words are transmitted to the response

controller 1016, which [judges] <u>decides</u> whether the service is possible or not

(S1016). The service is [judged] <u>determined</u> to be possible when a suitable

conversation data is found in the dialog data storage 1018 (S1016Y).

15   Necessary information for the service is acquired from the dialog data

storage 1018 and, if necessary, by the search unit 1024 (S1018). The service

is performed via the agent output unit 1030 (S1020).

[0212]   [On the other hand] <u>Alternatively</u>, when the response controller 1016

[judges] <u>determines</u> the service not to be possible or when it cannot understand

20   the user's request (S1016Y), it reads a formatted apology from the dialog data

storage 1018 to make the agent output unit 1030 utter the apology (S1022) and

records the request as an [unattained] <u>undeciphered user</u> request to the log

storage 1020 (S1024). The communication unit 1022 transmits the [unattained] <u>undeciphered user</u> requests to the system manager (S1026).

[0213]   Figs. 24 to 29 show an example of the [interruption] <u>interaction</u> between [the] <u>a</u> user and an agent. In Fig. 24, <u>an</u> Electricity Agent 1062ₓ which

5   is in charge of services regarding electricity related mattersₓ appears on the screen 1060 and accepts user questions as to electric appliances. The user inputs a requestₓ such as a question in an <u>input</u> area 1064. The user inputs "Something's wrong with my mobile phone".

[0214]   <u>The</u> Electricity Agent 1062 answers "OK, tell me concretely.ₓ" as shown

10   in Fig. 25. The user inputs "Battery is not charged". The first check[ ]point for this problem is read from the dialog data storage 1018 and <u>the</u> Electricity Agent 1062 asks "Is the battery pack correctly attached?ₓ" as shown in Fig. 26. The user answers "Yes" to this question. Then the next check[ ]point is confirmed. In this exampleₓ thereforeₓ the function of <u>the</u> Electricity Agent 1062

15   is an embodiment of so-called FAQ for electric appliances.

[0215]   Fig. 27 shows the response of <u>the</u> Electricity Agent 1062 when it could not understand the request. In this case, the user wants to know <u>if</u> his/her electric devices can operate in Africa before the trip and asks "Let me know the standard voltage in Africa". <u>The</u> Electricity Agent 1062 is, however, not

20   designed to cope with such a question and cannot find a suitable answer in the dialog data storage 1018. The user request is recorded as an [unattained]

underciphered user request in the log storage 1020. The Electricity Agent 1062

answers "... I am very sorry! Please contact our staff at 03-xxxx-xxxx" to hand

over the question to a human operator. The system manager, viewing the

[unattained] underciphered user request, can [implement] subsequently include

5   the voltage information [in] for each country in the dialog data storage 1018 to

thereby continuously improve the FAQ.

[0216]   Fig. 28 shows a scene for information search. The Cooking

Agent 1066 (for providing information regarding cooking, especially recipes, to

the user) appears on the screen. The user inputs a request "Recommend a

10   Chinese recipe". The Cooking Agent 1066 searches for recommendations

through the search unit 1024 and displays the recommended items in a search

result area 1068. The user can click the items displayed in the area 1068 to

acquire more information via the Internet 1040. In this situation, if the user

inputs a question, such as "Let me know a typical recipe in [the] ancient Rome",

15   [this] the request will probably be recorded as an [unattained] underciphered

user request. The system manager can review the information regarding

recipes from various views and can improve the content of the dialog data

storage 1018.

[0217]   Fig. 30 shows the internal structure of the log storage 1020. The log

20   storage 1020 records all the conversation sessions 1080 between the user and

[the] an agent. In Fig. 30, conversation sessions 1080 for "userABC" and

"userDEF" are shown. When the user support system 1010 is a stand-alone

type, it can create a history of multiple users by admitting login of the users.
When the log storage 1020 is implemented in the back end [web] Web server, it
can record a history of multiple users [of] and multiple user support
systems 1010.

5   **[0218]**   The conversation sessions 1080 further comprises a dialog record
column 1090 and an [unattained] undeciphered flag column 1092. In the former
column, "u" and "a" stand for the utterances of the user and [the] an agent,
respectively. In the latter column, the flag is set to one when the request is an
[unattained] undeciphered user request and is set at zero otherwise.

10   **[0219]**   Fig. 31 illustrates an [unattained] undeciphered user request list 1100
generated by the communication unit 1022. The list 1100 comprises a user
column 1102 to record the names of users who [inputted unattained] input
undeciphered user requests, a mail address column 1104, a date and time
column 1106 to record when the [unattained] undeciphered user request
15   occurred, and a full sentence column 1108 to store the entire sentences of the
[unattained] undeciphered user requests. The system manager, after checking
the [unattained] undeciphered user requests, may [answer] respond to the
users [with] via electronic mails.

[0220]   [Embodiment 2 is described. Embodiment 2 also has various
20   modifications.]

[0221]   In [one] <u>another preferred</u> embodiment, the response controller 1016

may check the full sentence of the user's request directly against the dialog

data storage 1018. In this case, [unattained] <u>undeciphered user</u> requests may

be registered as a whole sentence<u>,</u> such as "Let me know the standard voltage

5   in Africa<u>,</u>" together with the suitable response for the request.

Embodiment 3

[0222]   Embodiment 3 [aims to] provide<u>s</u> a technique to [realize] <u>offer</u>

interaction among a plurality of agents [or]<u>, which may be displayed as</u>

<u>animated</u> characters<u>,</u> from a different technical view. According to Embodiment

10   3, characters which have been created entirely independently can have

interaction. This embodiment also provides a technique to efficiently develop

such agent functions.

[0223]   Fig. 32 shows [the entire] <u>a preferred</u> configuration of the user support

system 2010 according to Embodiment 3. A user terminal 2012, a control

15   window management site 2016, a chat server 2018 and a recipe server 2020

are <u>all</u> connected via the Internet 2014. The control window management

site 2016, the chat server 2018 and the recipe server 2020 are servers in a

broad sense of the [word] <u>term</u>.

[0224]   The chat server 2018 and the recipe server 2020 are in charge of

20   [respective] specialized areas so that they interpret user [utterance] <u>dialog</u> and

process the actions of agents. The chat server 2018, for example, processes

greetings, such as "Hello", whereas the recipe server 2020 processes

[utterance] <u>user references</u> concerning recipes, such as "Let me know a good

recipe". By assigning specialized functions to each specialized server, the

whole process can be divided and distributed so that the maintenance of each

5   agent becomes easier.

[0225]   The chat server 2018, the recipe server 2020 and the like are

collectively referred to as "specialized" servers or "expert" servers; and the

agents [put] <u>supported</u> in the specialized servers are referred to as "expert"

agents. The control window management site 2016, the chat server 2018 and

10   the recipe server 2020 may be realized in different nodes on the network.

Alternately, the control window management site 2016 may be implemented in

the chat server 2018, which may be designed as the originating server to

handle the interaction with the user terminal 2012. The example below is

described on the latter assumption.

15   **[0226]**   The basic process <u>shown</u> in Fig. 32 is as follows[.]<u>:</u> The user

terminal 2012 first connects to the control window management site 2016 <u>via</u>

<u>the Internet2014</u>. The site 2016 [comprises] <u>performs</u> a total management

function to manage a plurality of agents, [and] <u>as well as</u> a character

management function to manage a plurality of characters simultaneously.

20   These functions are referred to <u>hereinafter</u> as "horizontal functions"

[hereinafter]. The horizontal functions, which are characteristic of the present

embodiment, work as a bridge to allow different agents to interact <u>by</u> having

conversations. The site 2016 transmits a program to [realize] provide the horizontal functions to the user terminal 2012, which then [enjoys] is able to perform the horizontal functions even in an off-line environment.

[0227]   The user terminal 2012 then connects to the chat server 2018 to

5   receive a specific service. The chat server 2018 is specialized for chat and [comprises] supports an agent control function to realize the chat service and a character control function to work for the same purpose. These specialized functions are referred to as "expert functions" or "specific purpose functions". The specific purpose functions are designed [to] and implemented in each

10   expert server. The recipe server 2020 has the specific purpose functions regarding recipes. Specialized servers may be provided for a travel agent, a PC agent and [the like in] various other information which users may be interested in.

[0228]   The user first talks to the chat agent to request [an arbitrary] a

15   particular service. The chat agent acquires and interprets the user [utterance] request. When the [utterance] request relates to a recipe, the chat agent calls the total management function to make the recipe agent appear on the screen. The total management function divides the screen of the user terminal 2012 into two frames in which the chat agent and the recipe agent are put separately.

20   The two agents have interaction including greetings and the like. For this purpose, the horizontal function is [called] invoked. The interface between the horizontal function and specific functions is predefined. It becomes possible for

each agent to talk to another agent as [log] long as the agent is designed on the

interface. The interaction with another agent is not possible without the

horizontal function. [The] An agent [must] should respond to another agent

when [it is talked to] a dialog is initiated. To this end, functions according to the

5   interface must be implemented in the agent so as to take actions responsive to

the total management function. The agents can be put in windows instead of

the frames [throughout] in any of the embodiments discussed in this

specification.

[0229]   Various functions so far described are [realized] embodied in the form

10   of computer program functions. For this purpose, the main developer of the

entire user support system 2010, or the ["]leading developer["], first implements

the horizontal function in the control window management site 2016 as the

basic framework of the entire system, and informs other designers of expert

agents or ["]general developers["] of the horizontal function. The general

15   developers [can] will know the horizontal function which they can use[,] and the

format and content of each function. The leading developer, on the other hand,

decides the content of program functions to realize specific functions of each

agent so that the horizontal function can issue instructions to each agent. The

general functions must implement the program functions [informed] determined

20   by the leading developer. The ["]interface["] may be regarded as [the whole

specification regarding] the program functions described above.

[0230]   Fig. 33 illustrates the internal structure of the control window

management site 2016[. The control window management site 2016] which

comprises a total system manager 2022, a character manager 2024[,] and a

user dialog processor 2026, each of which communicates with the user

5   terminal 2012 via a communication unit 2028 and the Internet 2014. The total

system manager 2022 [realizes] supports the horizontal function at the agent

level. Similarly, the character manager 2024 [realizes] supports the horizontal

function at the character level. The user dialog processor 2026 displays a user

input prompt on the screen of the user terminal 2012 and acquires letters

10   [inputted] entered by the user. The functions of the control window

management site 2016 may be downloaded to the user terminal 2012

beforehand and may work inside the user terminal 2012.

[0231]   The total system manager 2022 provides a field to [realize] enable the

interaction among a plurality of agents and manages the agents [totally]

15   completely. The substance of the total system manager 2022 in this

embodiment is an HTML file[,] in which program functions described in a script

language include the following ones[.]:

          AddAgent(): add a new character to the field,

          Bcast(): inform all [the characters] displayed characters of an

20   information item,

          Tell(): inform one agent of an information item,

          ReqUI(): request the chat agent to acquire user information,

          ReqPr(): request the user input prompt to be displayed.

[0232]   In these functions, attributes (such as target information and target agent) may be described. These functions are provided as standard functions, which the general developers can use when designing an agent. The total system manager 2022 also manages [Cookies] <u>cookies</u> to be set in the browser of the user terminal 2012.

[0233]   The character manager 2024 provides a basic function to visually [express] <u>present</u> the interaction among the agents at the character level. The character manager 2024 is also an HTML file in which functions are written in a script language. Some examples of the functions are as follows[.]<u>:</u>

WalkClose(): move to a specified character,

PointWin(): point at a specified window,

Talk(): talk to a specified character.

[0234]   These functions are also provided as standard functions. To realize these functions, the character manager 2024 has a function to detect the positions of all the characters.

[0235]   Fig. 34 shows the internal structure of the chat server 2018. In this figure, "H", "I", "F" and <u>"X"</u> stand for utterance data, index search for utterance, a file name containing the URL of the page of the expert server<u>,</u> which should respond to a specified user utterance, and unidentified utterance, respectively.

[0236]   An agent controller 2066 obtains and interprets a user request via [a] <u>an animated</u> character so that the substantial function of an agent is realized. A

character controller 2068 provides a series of basic functions of a character

used by the agent controller 2066. At least one [set] combination of the agent

controller 2066 and the character controller 2068 is implemented in each

specialized server to conduct a specialized service. A communication unit 2030

5   enables communication between the agent controller 2066 and the character

controller 2068 with the user terminal 2012 via the Internet 2014.

[0237]   The agent controller 2066 has a series of functions to respond to the

utterance of the user or other agents, [which are] hereinafter referred to simply

as "target utterance". A main controller 2060 controls a series of processes

10   mainly conducted by an utterance acquiring unit 2032 and the character

controller 2068. The essential function of the main controller 2060 is to specify

a page which [should respond] corresponds to each target utterance and moves

to the page. The utterance acquiring unit 2032 acquires the target utterance

from the user terminal 2012 and sends it to an utterance search unit 2034. The

15   utterance search unit 2034 first conducts an index search by verifying the first

letter or word of the target utterance in an index file 2036. After the index

search, the utterance search unit 2034 [specifies] attempts to identify the target

utterance by conducting a phrase search considering the entire target

utterance. In the phrase search, not only the words but also the order of the

20   words are considered. When the target utterance cannot be found by the

phrase search, the utterance may be divided into words and a keyword search

may be conducted.

[0238]   The index file 2036 contains [in an alphabetic order] assumed or

anticipated utterances <u>in an alphabetic order</u> which are stored in an assumed

utterance collection 2038 to [specify] <u>identify</u> the target utterance. It is generally

possible to conduct a fast search by referring the first letter or word to the index

5   file 2036 even when the assumed utterance collection 2038 is large. As

described later[,] in this embodiment, the assumed utterance collection 2038 is

easily expanded, and the fast search realized by the index search is beneficial.

[0239]   When the target utterance is [specified] <u>identified</u> in the index file

2036, a file containing the URL and [the like of] <u>other information corresponding</u>

10   <u>to</u> the specialized server to respond to the target utterance is [specified] <u>also</u>

<u>identified</u> in the index file 2036. The file stored in the assumed utterance

collection 2038 is then opened and the URL is acquired. Each target utterance

has one file in the assumed utterance collection 2038.

[0240]   When the URL is within the chat server 2018 itself, the URL is

15   transmitted to the main controller 2060, which sends the URL to the browser of

the user terminal 2012 via the communication unit 2030.

[0241]   When the URL is within another specialized server, the URL is set to

the browser of the user terminal 2012 and the user terminal 2012 accesses the

specialized server. To be more precise, the URL points not the home page of

20   the specialized server but a specific independent page to directly respond to the

target utterance. Each utterance has at least one corresponding page in this embodiment.

[0242]   It is naturally desirable that the target utterance has its complete copy in the assumed utterance collection 2038. During the improving process of the

5   assumed utterance collection 2038, however, the target utterance does not necessarily have its perfect copy in the assumed utterance collection 2038. In that case, the utterance search unit 2034 seeks the most probable utterance in the assumed utterance collection 2038 [decomposing], parsing the utterance into words and retrying the search by inputting logical ANDs of the individual

10   words, especially nouns. The target utterance which could not be found, or which was found only in the retry search, is recorded in an unidentified utterance file 2040 as an unidentified utterance, which is transmitted to the system manager by [an] e-mail via the reporting unit 2042.

[0243]   The system manager requests the manager of the specialized server,

15   which should have responded to the unidentified utterance, to improve the response process conducted by the expert agent. The manager of the specialized server registers the unidentified utterance and the URL of a page of the specialized server, which should [respond] correspond to the unidentified utterance, in the assumed utterance collection 2038 within the specialized

20   server[,]. The manager of the specialized server also registers the index of the utterance in the index file 2036[,] and designs the process, including the action of the expert agent [realized] associated with the page. In this maintenance, an

unidentified utterance can be easily added in the assumed utterance collection

2038 and it is generally easy to improve the content of the assumed utterance

collection 2038 in this manner.

[0244]   The main controller 2060 also manages a personal information

5   file 2048. The personal information file 2048 may be managed only by the chat

server 2018 among a plurarity of specialized servers as the chat server 2018

frequently has conversation with the user and is suitable to acquire the personal

information of the user. The main controller 2060, for example, may be

implemented with a program function to periodically ask the user information,

10   such as the age of the user and other attributes [and], such as the preference

[on] of foodstuffs and the like. Answers from the user may be recorded in the

personal information file 2048. Other agents can request to acquire the

personal information using the aforementioned program function ReqUI(). The

personal information may be used when specialized servers perform services

15   [to] for the user. In this embodiment, the chat agent may issue an instruction

instead of the user when another agent conducts a service [to] for the user.

Agents may also interact during the process.

[0245]   The main controller 2060 may be implemented with the program

functions below[.]:

20   Respond(): is called when [a] an animated character is clicked and

describes a proper process to the click,

        Listen(): acquires information when transmitted from another agent.

[0246]   Implementation of these functions is entrusted to the general developer of the chat server 2018. These functions are called from the total system manager 2022, the character manager 2024 and [the like] other similar modules.

5   [0247]   A character controller 2068 comprises an action file 2062 to describe the actions of [a] an animated character to respond to each target utterance, and [a] character data storage 2064 to store the image data and voice data of the character. The character data 2064 is first downloaded to the user terminal 2012 and can work within the user terminal 2012.

10   [0248]   The character controller 2068 is, for example, implemented with the [below] program functions listed below[.]:

   ComeOut(): makes characters appear on the screen,

   Act(): makes a character play a designated action,

   Spk(): displays a designated text in a window and outputs voice data

15   according to the text,

   GoOut(): makes a character disappear on the screen,

   Halt(): [Freezes] freezes all the characters.

[0249]   The basic action of a character is [realized] controlled with the above functions. The development of these functions is also entrusted to the general

20   developers. These functions are also called from the total system manager 2022 and the character manager 2024.

[0250]   An access recorder 2044 records the access history of each user to the specialized servers in an access information file 2046. By this configuration, a response to the same user utterance may be made different [to] for each user. For example, when a user first visits the chat server 2018 and says "Hello", the

5   chat agent answers "Hello. Nice to meet you". When the user revisits the chat server 2018, the chat agent may answer "Hello, how are you getting along?" to act more properly according to the situation. The access recorder 2044 informs the utterance search unit 2034 of the access history of the user. The utterance search unit 2034 selects a page suitable for the present situation and sends the

10   URL to the browser of the user terminal 2012 [when it found] if a plurality of pages of a specialized server are found to respond to the target utterance in the assumed utterance collection 2038, just like the above example.

[0251]   Fig. 35 shows the internal structure of the index file 2036. Fig. 36 shows the internal structure of the assumed utterance collection 2038. The

15   index file 2036 comprises an alphabetic column 2100, a target utterance column 2102 and a file name column 2104. The target utterances are sorted in [the] alphabetical order [noting] by the first letter of the utterance.

[0252]   The assumed utterance collection 2038 comprises a file name column 2104, a target utterance column 2102 and a page column 2120 to

20   indicate the page [of] from the specialized server to respond to the target utterance. For example, when the user utterance is "Hi", the page of the specialized server is "URLa43". The combination of "Hi" and "URLa43"

composes the file f044. The target utterances are classified to each specialized

server. A user utterance collection 2110 [of] which the chat server 2018 should

[take care] manage and a user utterance collection 2112 [of] which the recipe

server 2020 should [take care] manage, for example, are generated

5 independently. The index file 2036 and the assumed utterance collection 2038

are linked together with file names. "Hello" corresponds to the file f045 in the

index file 2036, which in turn corresponds to the file f045 of the assumed

utterance collection 2038.

[0253] As shown in the index file 2036 of Fig. 36, "Hello" has two

10 corresponding pages URLa1 and URLa2. The URLa1 is sent to users who first

visit the chat server 2018, and URLa2 is sent to users who revisit the chat

server 2018.

[0254] Fig. 37 shows the access information file 2046. "User 1" has visited

"chat", "recipe" and "auction" servers. "User 2" has visited "travel" and "PC"

15 servers. In this situation, when [the] user 2 visits the chat server 2018, the chat

agent selects an utterance for [the first] an initial visitor, and when user 1 visits

the chat server 2018, the chat agent selects an utterance for a [revisitor] repeat

visitor.

[0255] Fig. 38 shows the internal structure of the action file 2062. The URL

20 specified in the utterance search unit 2034, such as the URLa1 or URLa2 in

case of "Hello" shown in Fig. 36, is [inputted] input to the action file 2062 via the

main controller 2060. In the action file 2062, each URL specified [at] <u>by</u> the

utterance search unit 2034 [is corresponded] <u>corresponds</u> to each page, for

example, URLa1 to page 70, URLa2 to page 72 and URLan to page 74<u>,</u> so that

multiple pages are bundled. Each page is a Web page and is provided for each

5   target utterance to achieve system flexibility.

[0256]   [The] <u>An example of the</u> content of a page contained in the action

file 2062 is now described. The name of [a] <u>the</u> page is "AC.html" and has a

function to load and display a standard <u>animated</u> character provided by a

certain [OS] <u>operating system</u> under the name of "AChara". The character

10   speaks when the function Spk is called [from outside] <u>extermally</u>.

```
<html>
<head>
<title>TEST</title>
<meta http-equiv="Content-Type" content="text/html; charset=Shift_JIS">
```

15   `</head>`

```
<body bgcolor="#FFFFFF">
<!--declaration and load of Agent of company x-->
<OBJECT ID="AgentControl" CLASSID="xxx" CODEBASE="#VERSION=
2,0,0,0">
```

20   `</OBJECT>`

```
<SCRIPT language=Javascript>
var AChara;
Agent.Characters.Load("AChara","C:¥¥XXX¥¥Xagent¥¥CHARS¥¥AChara.acs")
```

;

AChara=Agent.Characters.Character("AChara");

AChara.ComeOut();

</SCRIPT>

5   <SCRIPT language=Javascript SRC="AC.js"></SCRIPT>

</body>

</html>

[0257]   A script file is used. The character speaks using the function, which collectively stands for HTML files and functions written in script languages. The

10   script file is as follows[.]:

function SPK(spText) {

        AChara.Speach(spText);

        }

[0258]   When the name of a frame in which AC.html is displayed is "aFrame",

15   it becomes possible to make AChara speak from outside by writing as follows[.]:

aFrame.Spk("Good-bye");

[0259]   Fig. 39 illustrates the internal blocks of the user terminal 2012. Each function of the user terminal 2012 may be provided from the control window management site 2016, the chat server 2018, the recipe server 2020 [and] or

20   other expert servers[, may]. The functions may also be pre-installed in the user terminal 2012 or may be downloaded from the control window management

site 2016 when the user terminal 2012 is first connected to the site 2016 and is

held locally. In other words, when the user support system 2010 is realized with

the user terminal 2012, the control window management site 2016 and other

servers[,] each function for processing may be installed in the client or in the

5   server or in any other locations. As a general rule, functions which should be

less frequently updated, or which need no updating, may be pre-installed in the

client.

[0260]   A communication unit 2114 communicates with the control window

management site 2016 and [the like] other servers via the Internet 2014. A

10 control window 2080 comprises a first processor 2082, a second

processor 2084 and a user dialog processor 2086. The first processor 2082

comprises a total system manager 2090, which manages a chat agent

controller 2092 and a recipe agent controller 2094. The total system

manager 2090, the chat agent controller 2092 and the recipe agent

15 controller 2094 correspond to the total system manager 2022 of the control

window management site 2016, the agent controller 2066 of the chat

server 2018 and an agent controller (not shown) of the recipe server 2020,

respectively. The chat agent controller 2092 and the recipe agent

controller 2094 manage a chat region generator 2106 and a recipe region

20 generator 2108, respectively, to display the result of services[, respectively].

The second processor 2084 comprises a character manager 2096, which

manages a chat character controller 2098 and a recipe character

controller 2116. The character manager 2096, the chat character

controller 2098 and the recipe character controller 2116 correspond to the

character manager 2024 of the control window management site 2016, the

character controller 2068 of the chat server 2018 and a character controller (not

shown) of the recipe server 2020, respectively. The user dialog processor 2086

5   corresponds to the user dialog processor 2026 of the control window

management site 2016. The first processor 2082 and the second processor

2084 refer to the information inputted in the user dialog processor 2086.

[0261]   The above functions, which have been described with regard to

Figs. 33 and 34, can be viewed [from] by the user when in operation. The chat

10   region generator 2106 and the recipe region generator 2108 display information

to the user and accept instructions and other operations from the user. The

second processor 2084 provides information in a visible or audible manner and

accepts user operations such as clicks. The user dialog processor 2086

displays a user input prompt and accepts [character] text input.

15   [0262]   [Now the] The interaction between the user and agents and among

agents [is] will now be described. Fig. 40 illustrates a screen 2150 displayed

when the user initiates the user terminal 2012. A character 2156 of the chat

agent, [which is] hereinafter referred to as "Chat Agent" 2156, appears and

[speaks] says, for example, "Hello! I am Chat Agent Pea-ko". The user inputs a

20   query of the Chat Agent 2156, such as "Let me know a recipe" in an input

region 2154 and clicks a SEND button. The input area 2154 may appear when

the user clicks Chat Agent 2156. Chat Agent 2156 may talk to itself or ask a question [to] of the user to encourage the user request until the user clicks it.

[0263] [Inputted "Hello"] Input text is acquired by the user dialog processor 2086 and is analyzed by the chat agent controller 2092. The chat

5   agent controller 2092 has inside a copy of the function of the agent controller 2066 in the chat server 2018 and specifies a page in the action file 2062 of the character controller 2068 to respond to the user. The page may be identified in the action file 2062 of the character controller 2068 or in the chat character controller 2098 of the user terminal 2012. In this example, the target

10   utterance relates to recipe and a process "Call a recipe agent on the screen" is described in the specified page for the response. More concretely, a program function ADDAgent() prepared by the total system manager 2022 is written in the HTML file beforehand. That is, a horizontal function at the agent level is used to bridge different agents when the process executed by an agent relates

15   to another agent.

[0264] Fig. 41 shows a screen 2150 appearing after the above process. The total system manager 2090 divides the screen 2150 into a first frame 2150a and a second frame 2150b. Chat Agent 2156 is placed in the former and Recipe Agent 2160 is placed in the latter. Before Recipe Agent 2160 is called, Chat

20   Agent 2156 [says] will indicate this by telling the user "Now, let's call Recipe Agent ..." [to the user]. Recipe Agent 2160 on the other hand asks "I am Recipe Agent. What is your preference?" to the user when it is called. The

utterance of Chat Agent 2160 is realized by the recipe agent controller 2094

and the recipe character controller 2116 using a program function such as Spk()

to make a character speak written in a page (not shown) to respond to the user.

The user then inputs "Chinese" in the input region 2154 and sends it to the

5   server.

[0265]   Continuing the example, Fig. 42 shows the screen 2150 after the

above process. Chat Agent 2156 interprets that the utterance of Recipe

Agent 2160 relates to the introduction of a dish. The chat character

controller 2098 specifies a page to respond to the utterance. In the page, the

10   note "Advise the agent presently speaking not to recommend hot dishes" is

described. Chat Agent 2156 comes closer to Recipe Agent 2160 and [talks]

relates "Do not teach very hot ones" as a request. For this purpose, the

aforementioned WalkClose()and Talk() are written in the page of Chat

Agent 2156. Recipe Agent 2160 on the other hand accepts the advice as the

15   ["]utterance of another agent["], interprets the utterance and specifies a page to

respond. In the page, for example, the note "Obey the request. Search for a

recipe without chili sauce" [is] may be written. In this case also, the function

Talk() is used to make Recipe Agent 2160 and Chat Agent 2156 face each

other on the screen. In the background process, the chat agent controller 2092

20   executes a search using a search condition or a [firmula] formula, such as

("recipe" OR "menu") AND "Chinese" AND "recommendation" AND /"chili

sauce",

where "/" is a NOT operator. The preference of the user [is] has been recorded beforehand in the personal information file 2048.

[0266]   Fig. 43 shows the screen 2150 containing the search result obtained by Recipe Agent 2160. Recipe Agent 2160 says "Today's recommendation".

5   The search result is displayed in a recipe window 2166 generated by the recipe region generator 2108. The search result is displayed with titles which are linked to details. Sites containing Chinese recipes found by the search are displayed in a search result area 2172 by the recipe agent controller 2094 for the reference. Chat Agent [is] appears to be asleep as it has not been talked to.

10   Pages may be designed to respond not only to the content of the target utterance but also to the interval or other states of the [utterance] discussions with the user and other agents.

[0267]   In Fig. 43, the user further inputs a question "Tell me good places for autumn hiking". Fig. 44 shows the screen 2150 appearing after the question is

15   [inputted] input. In the screen, a third frame 2150c is created and a Travel Agent 2170 appears in the frame. Chat Agent 2156 talks to Travel Agent 2170 saying, for example, "Hello. Long time no see you." and Travel Agent 2170 answers "Hi". The interaction between different agents here is also [realized] controlled by the aforementioned program functions or the like.

20   **[0268]**   The effect of the present embodiment is as follows[.]:

[0269]   Different agents provided from different companies or creators can have interaction by standardizing the interface at a program function level. Agents which have completely different output formats, such as a 3-D polygonal character written in VRML (Virtual Reality Modeling Language), a 2-D character

5   in JPEG (Joint Photographic Expert Group) [and] or an arbitrary bit map character the user created with a digital camera, can have conversations on the same screen and thereby can provide an [exquisite] interesting and entertaining agent apparatus.

[0270]   By adopting a standardized interface, the leading developer can

10   effectively collaborate with general developers or [the] with third parties. The leading developer develops the control window management site 2016 and the general developers develop expert agents. The number of expert agents can be increased relatively easily in accordance with the user request by designing each agent in a modular manner.

15   [0271]   A few modifications are now described. The user terminal 2012 may be pre-installed with a plurality of expert agents which are frequently used. The user terminal 2012 may download such agents beforehand. In that case, if an agent which should be called after the interpretation of the utterance by Chat Agent 2156 exists inside the user terminal 2012 from the beginning, the process

20   performed by Chat Agent 2156 is made unnecessary, and the expert agent may appear immediately on the screen 2150 without the help of Chat Agent 2156.

Such expert agents may be hidden in the user terminal 2012 even when they exist therein.

[0272]   The control window 2080 may be a conceptual framework provided by the control window management site 2016. In actual implementation, however, the control window 2080 may be provided visibly or invisibly, linked with an arbitrary object or a region on the screen 2150. The control window 2080 may be set on the entire screen 2150 in an invisible manner so that Chat Agent 2156 appears when the user clicks on an arbitrary portion of the screen 2150.

[0273]   The target utterance may be acquired via voice recognition hardware and software. Users may feel it more natural to input their request via voice.

[0274]   An unidentified utterance is described as an utterance which could not be specified in the assumed utterance collection 2038. The unidentified utterance, however, may be one which could be specified in the assumed utterance collection 2038 but to which the expert agent could not properly respond. For example, when the target utterance is "Let me know a recipe", the search result may contain too many information items. In this case, the user [eventually cannot] would not be able to find desired information. Such a target utterance may be sent to an expert agent manager so that the expert agent is improved.

[0275]   Utterance from an expert agent [has been] may be selected based on the access history of the user to each expert server. The utterance may be

further selected based on the attribute information of the user. The expert

agent may select a more gentle expression when the user is a female. The

agent may select a more formal or polite expression when the user is relatively

[old] elderly.

5 **[0276]**   It is not always necessary for expert agents to interpret the user

utterance using the full sentence search. A "beef" expert agent may be

designed such that it always responds to the word "beef" or "meat" regardless of

the whole sentence. Each expert agent may be implemented with a different

method for interpreting the user utterance. A single expert agent may have

10 more than one method to interpret the user utterance.

[0277]   The character manager 2096 of the second processor 2084 may be

combined with the total system manager 2090 of the first processor 2082.

There may be various modifications to achieve the same functions. Combining

or dividing the functional blocks depends on the design guide and the actual

15 desired operation.

[0278]   An action of a character such as "Speak" was described to be sent

from a server to each character controller. The action, however, may be

received by each agent controller, which sends it to each character controller

via the total system manager 2090. In this method, the total system

20 manager 2090 can detect all the situations occurring in the system. The total

system manager 2090 can more easily [realize] control an action of a character

to "Speak" to all the other characters and make a character recognize the action

of another character as the total system manager 2090 knows the frame names

in which each character controller resides, the number of expert agents or

characters and the positions of the characters.

5   Embodiment 4

[0279]   If a user wants to revisit [in future] a specific [web] Web site in the

future, he/she usually puts a bookmark on the URL of the [web] Web site. The

number of bookmarks thus stored is easily increased as the user browses [web]

Web sites. According to Embodiment 4, agents or characters help the user find

10   a desired [web] Web site easily.

[0280]   Fig. 45 shows the entire configuration of a network system 3010

including a user support system 3016 according to Embodiment 4. A user

terminal 3012 and a user support system 3016 are connected via the

Internet 3014.

15   **[0281]**   The user support system 3016 comprises an originating server 3020,

a chat server 3024 and a gourmet server 3026, which are connected to the

Internet 3014. The originating server 3020 comprises an electronic user

utterance collection created by anticipating or assuming user utterances and an

utterance identification block to specify the user utterance when it is inputted.

20   The user utterance identification block is commonly referred to [from] by other

servers in the system, for example, the chat server 3024 and the gourmet

server 3026. The chat server 3024 and the gourmet server 3026 comprise an electronic agent action collection created by assuming the actions of an agent to respond to [the] a user utterance and a response block to make the agent respond to the user utterance, respectively. The servers have the response

5   blocks independently within their nodes.

[0282]   The originating server 3020, the chat server 3024 and the gourmet server 3026 are preferably located on different network nodes so that the process to specify a user utterance and the process to make an agent respond to the utterance can be conducted simultaneously [in] on different nodes.

10   Agents can be made [into] onto different nodes and the maintenance for each agent becomes easier. The system 3016 may be composed as a single unit to be implemented in a portal site. The servers, however, are included [in] on different nodes. The originating server 3020 behaves as a portal server for the user terminal 3012 that access the system.

15   [0283]   A user utterance is first transmitted to the originating server 3020, which [specifies] characterizes the utterance referring to the user utterance collection. An agent which should respond to the utterance is [specified] determined and the response block executes a process for the character's response. For example, an agent in the chat server 3024 may respond[s] to

20   general greetings, such as "Hello". An agent in the gourmet server 3026 may respond[s] to meals, foodstuffs and so on. Each expert agent [supports] operates to find information needed for the user out of a huge amount of

information by obtaining the needs of the user specified during the conversation with the user.

[0284]   According to the present embodiment, when the user puts a bookmark on a [web] <u>Web</u> site he/she likes, the bookmark information is automatically

5   classified into one of the folders prepared for specialized areas. For example, when the user puts a bookmark on a [web] <u>Web</u> site searched and presented to the user by the gourmet agent, the URL of the site is stored in a folder related to gourmet or a gourmet folder. The bookmark information is presented or displayed to the user [such] <u>in the manner</u> that it is classified in each folder.

10   **[0285]**   The process <u>shown</u> in Fig. 45 is summarized as follows[.]<u>:</u> A local agent implemented within the user terminal 3012 appears when the user initiates the user terminal 3012. The local agent waits for the first or initial utterance of the user. The initial utterance is sent to the originating server 3020 via the Internet 3014. The [www] <u>Web</u> browser in the user terminal 3012

15   displays a page [in] <u>from</u> the originating server 3020.

[0286]   The originating server 3020 is installed with a user utterance collection which holds expected user utterances. The initial utterance is searched in the user utterance collection so as to be identified. An expert agent [suitable for] <u>corresponding to</u> the <u>subject of the user's</u> initial utterance is specified and the

20   URL <u>of the specified specialized server</u>, which is shown as "URLa/URLb" in Fig. 45, [of the specified specialized server] is sent to the browser of the user

terminal 3012. The user terminal 3012 displays the image corresponding to the page [of] from the specialized server. The expert agent appears on the screen. Each specialized server includes an agent action collection for [a] the respective expert agent and responds to the initial utterance and further utterance of the

5   user, [which is] hereinafter referred to as a ["]general utterance["]. The action of an agent is exemplified with an utterance hereinafter. The action, however, may include a gesture and other behavior, colors in the screen image, [the] a change in texture, the search operation of the agent and other program processes [to] responding to the user.

10 **[0287]**   When the user gives a new utterance or a general utterance to the expert agent, the utterance is sent to the originating server 3020. The originating server 3020 again specifies an expert agent [suitable for] corresponding to the utterance and sends the URL of the specialized server to the user terminal 3012. [A] The series of steps below is preferably repeated[.]:

15 1. specify the user utterance by the originating server 3020;

2. specify a specialized server to [cope with] process the specified utterance;

3. respond to the user by the expert agent implemented in the specialized server;

4. encourage the user to input a new utterance.

20 **[0288]**   In each cycle of the above process, the initial step is always conducted by the originating server 3020.

[0289]   In the above process, the expert agent, by searching over the Internet,

presents the [user] information [needed] requested by the user. When the user

requests to register a bookmark [on] of the [web] Web site [having] containing

the presented information, a bookmark register provided in the originating

5   server 3020 stores the URL of the [web] Web site in a folder corresponding to

the specialized area of the agent.

[0290]   Fig. 46 shows the internal structure of the originating server 3020.

[Only the] The differences between Fig. 46 and Fig. 34, which shows the

internal structure of chat server 2018, is now described.

10   [0291]   The bookmark register 3050 stores in a bookmark file 3054 the URL of

the [web] Web site upon request [for the registration from] of the user. The

bookmark information is classified and stored in one of the folders which [is] are

provided for in the specialized area. A bookmark display unit 3052 displays the

bookmark information stored in the bookmark file 3054 classified in the folders.

15   [0292]   An index file 3036 is shown in Fig. 35 in Embodiment 3. A user

utterance collection 3038 shown in Fig. 47 is [almost the same as] similar to the

one shown in Fig. 36 in Embodiment 3. In Fig. 47, however, files f267 and f306

relate to a restaurant or gourmet.

[0293]   Fig. 48 illustrates the internal description of an access information

20   file 3046. The access information file 3046 is [almost the same as] similar to

the one shown in Fig. 37. In Fig. 48, however, "recipe" is replaced by

"gourmet".

[0294]   Fig. 49 shows the internal structure of the bookmark file 3054. The

bookmark information registered by "user1" is classified and stored in "gourmet

5   folder", "chat folder" and so on. Each folder stores a plurality of bookmarks.

"Gourmet folder", for example, stores the URL "http://OO.com" of the [web] Web

site "Chinese restaurant B" as bookmark 1 information and the URL

"http://XX.com" of the [web] Web site "restaurant C" as bookmark 2 information.

[0295]   Fig. 50 shows the internal structure of the gourmet server 3026 as an

10   example of specialized servers. A communication unit 3060 communicates with

the user terminal 3012, the originating server 3020 and the like via the Internet

3014. The URL specified by the utterance search unit 3034 of the originating

server 3020 is input to an agent action library 3062 via the communication unit

3060. The agent action library 3062 includes agent data 3072 which describes

15   the expert agent utterance, image and behavior. Each URL specified by the

utterance search unit 3034 has a page corresponding thereto.

[0296]   In Fig. 50, the page 64 corresponding to the URLa1 is illustrated. The

page 64 includes an agent output unit 3070, a user utterance acquiring

unit 3074 and a specific process execution unit 3076. The agent output

20   unit 3070 responds to the user utterance with the gourmet agent based on the

agent data 3072. The specific process execution unit 3076 conducts processes

other than response<u>s</u> by [utterance] <u>agents</u>. The specific process or purpose

execution unit 3076 may execute various programs <u>to support other functions of</u>

<u>the system</u>. A search unit 3078 searches information requested by the user via

the Internet 3014. For example, the utterance which leads the user to the page

5   [is] "Teach me good restaurants in New York", <u>results in</u> the gourmet agent

[searches] <u>searching</u> for restaurant information via the Internet 3014 and

[presents] <u>presenting</u> the information to the user. The user utterance acquiring

unit 3074 acquires general utterances of the user and transmits them to the

originating server 3020, which specifies a specialized server again.

10   **[0297]**   Fig. 51 shows the internal structure of the user terminal 3012. A

communication unit 3130 communicates with the originating server 3020, the

chat server 3024, the gourmet server 3026 and [the like] <u>other specialized</u>

<u>servers</u> via the Internet 3014. [A UI] <u>The user interface (UI)</u> 3138 may be a

keyboard, a mouse, a display apparatus [and] <u>or other</u> various data interface

15   formats. A local agent output unit 3132 provides local agent data 3134 to the

user via the UI 3138. The initial utterance and general utterances of the user

are acquired by a user utterance input unit 3136 via the UI 3138. The acquired

utterance is sent to the originating server 3020 via the communication unit 3130

and the Internet 3014.

20   **[0298]**   Fig. 52 illustrates a <u>preferred</u> screen 3150 display[ed] when the user

terminal 3012 is initiated. A local agent 3152 appears and says "Welcome!

Let's chat". The user inputs "Hello" in an input area 3154 and sends it. The

input "Hello" is sent to the originating server 3020 as the initial utterance, from which the chat server 3024 as a specialized server is specified. The user terminal 3012 accesses a page in the chat server 3024.

[0299]   Fig. 53 illustrates the screen 3150 displayed after the above process.

5   A Chat Agent 3156 is displayed. In the present embodiment, the local agent 3152 is the same as Chat Agent 3156 by appearance so that a seamless conversation continues. A bookmark button 3190 is displayed by the bookmark file 3054 on the screen. When the user pushes the bookmark button 3190, the bookmark information stored is displayed with the folders. The Chat Agent

10   3156 [speaks] says "Hello! I am Chat Agent Pea-ko...". The user [inputs] may, for example, input in the input area 3154 "Let me know a restaurant serving good Peking ravioli". The utterance is acquired by the originating server 3020 which identifies a page in the gourmet server 3026. The URL of the identified page is sent to the user terminal 3012, which accesses to the page.

15   **[0300]**   Fig. 54 illustrates [the] a screen 3150 that is preferably displayed after the above process. The Gourmet Agent 3160 appears and [speaks] says "All right! Trust me. I am Gourmet Agent." The search unit 3078 searches [over] through the [web] Web pages using a keyword "Peking ravioli". The agent [speaks] says "Wait for a moment. I will come back soon." [not to be silent and]

20   in order to let the user know the search process is in progress. When the search is finished, a page to [display] show the search result is displayed on the user's terminal.

[0301]   Fig. 55 illustrates the screen 3150 displaying the page for the search

result. The titles 3170 of the [web] Web pages obtained by the search unit 3078

are displayed on the search result page. Each title 3170 is linked to the [web]

Web page so that the user can easily access [thereto] a page by clicking the

5   link. When the user clicks a register button 3180, the corresponding URL of the

[web] Web site is stored in the gourmet or other appropriate folder contained in

the bookmark file 3054.

[0302]   Fig. 56 illustrates the screen 3150 displaying the registered bookmark

information. When the user clicks a bookmark button 3190, a folder list 3192 is

10   displayed by the bookmark display unit 3052. When the user puts a cursor on

the gourmet folder, the titles 3194 of the [web] Web sites stored in the gourmet

folder appear. The user can access to the URL of the [web] Web site when the

user clicks a title.

[0303]   [A few] Various modifications of the present embodiment are [as

15   follows] discussed below.

[0304]   In the present embodiment, the utterance identification block is

installed in the originating server 3020 and is commonly used by a plurality of

servers. Each specialized server, however, may have its own independent

utterance identification block and response block. In this configuration, each

20   server can manage its own user utterance collection and agent action collection

so that the management and maintenance of the agent becomes easier within

the server. A core server to process all the utterances may be provided even in this configuration.

[0305]   In the present embodiment, the images of the local agent 3152 and Chat Agent 3156 are made identical. Naturally, it is not necessary to match them. The local agent 3152 may not be installed in the user terminal 3012. Instead, an "opening agent" or the like which appears when the user terminal 3012 is initiated may be implemented in the originating server 3020.

[0306]   In the present embodiment, the bookmark register 3050, the bookmark display unit 3052 and the bookmark file 3054 are provided in the originating server 3020. These units [naturally] may be implemented in other specialized servers or in the user terminal 3012.

[0307]   In the present embodiment, each folder in the bookmark file 3054 corresponds to each specialized area of a specialized server. Naturally, folders may be classified on [an arbitrary] a selected criterion. For example, the system may request the user to designate a plurality of folders and to suggest which folder to be associated with which kind of [web] Web sites. When a [web] Web site is requested by the user to be registered, the type of the [web] Web site may be analyzed referring to the user utterance collection to specify a specialized area. A bookmark is then put on the [web] Web site and is stored in the folder associated with the specified specialized area. According to this

method, the bookmark information already stored in the user terminal 3012 may be reclassified.

[0308]   The folders in the bookmark file 3054 may be prepared beforehand or may be generated or modified by adding new folders requested [from] by the

5   user or any expert agents. The bookmark information may be classified when it is stored upon request from the user or may be classified later as mentioned. As long as the bookmark information can be classified and stored to help the user revisit the [web] Web site he/she likes, many modifications for creating folders are available.

10   Embodiment 5

[0309]   The whole network system including a user support system according to Embodiment 5 is the same as Fig. 45 of Embodiment 4.

[0310]   The user support system according to Embodiment 5 requests the user to register the items of information he/she is interested in and therefore

15   searches frequently. By requesting this registration, the search process can be immediately initiated when the user utterance relates to the information items. In this system, the search is also conducted even without the user utterance so that the search result can be presented immediately. User utterances [to be a trigger] used as triggers to start the search or to display the search results are

20   predefined to present the information [timely] to the user in a timely manner.

[0311]   [A] <u>An animated</u> character imitating a human or an animal is used to present the information to the user in such a manner that the character seems to perform the search spontaneously. By employing the character, even beginner[s] <u>users</u> of PCs [or the like] can feel relaxed <u>when using the system</u>.

5   Each character [is corresponded to each] <u>corresponds to a</u> specialized area of information<u>,</u> and the user can easily understand to which area the information now being processed belongs <u>by</u> watching the character<u>s</u>. Characters which are in charge of the areas the user is interested in<u>,</u> and <u>in which the user</u> conducts frequent search<u>es,</u> often appear to chat with the user. The user

10   [intimately interacts] <u>is able to directly interact</u> with the characters.

[0312]   Such characters may be registered as ["]favorite characters["] <u>of the user</u> so that the user can call them instantly. Favorite characters are so configured that the user can register the URLs of [web] <u>Web</u> sites he/she likes in areas related to the characters, which present renewal information of the

15   [web] <u>Web</u> sites to the user. Each character stores the URLs of the [web] <u>Web</u> sites which fall within the specialized area the character is associated with. In this configuration, bookmarks can be classified according to specialized areas as the characters virtually work as folders for the bookmarks. The user does not need to confirm whether information is updated or not in the [web] <u>Web</u> sites

20   as the character informs the user of the situation. The character may [inform] <u>report</u> the situation periodically<u>,</u> spontaneously or when the user utterance relates to the [web] <u>Web</u> sites.

[0313]   The favorite characters may be [raised] <u>treated similar to virtual pets</u> by the user. A ["]character house["] may be displayed on the screen in which the characters live. The attributes of the characters may change based on the attitude or behavior of the user on the characters. The characters may behave

5   differently according to the attributes. The attributes may include "cheer", which becomes larger when the user handles the character gently and becomes smaller when the user mishandles the character. A character with [the "cheer"] <u>a large cheer</u> attribute [being large] may frequently conduct the search, whereas a character with <u>a</u> small ["]cheer["] attribute may stop working until the attribute

10   is [recovered] <u>increased</u>. Such design of characters [gives] <u>provides</u> amusement <u>and entertainment</u> to the user.

[0314]   The major process flow of Embodiment 5 is [almost the same as] <u>similar to</u> Embodiment 4 [and] <u>with</u> the difference<u>s</u> [is] <u>being</u> described <u>as</u> <u>follows:</u>[.] The user utterance collection includes an additional utterance

15   collection which contains expected utterances to trigger [the] <u>a</u> search by expert agents.

[0315]   When the initial utterance of the user is detected in the additional utterance collection, the process jumps to a page to conduct <u>a</u> search and displays the search result. In the page, a process flow is written such that the

20   search is performed based on the data the user registered beforehand and that the search result is presented to the user via [the] <u>an animated</u> character. In another example, the situation whether the <u>registered</u> [web] <u>Web</u> site

[registered] is updated or not is [acquired and] presented to the user via the character. In these examples, the process itself jumps to the page for the search. Alternately, an instruction to start search is sent to an expert agent so that the search process is performed as a background process. When the

5   background process is performed, the conversation between the character and the user may be continued.

[0316]   With regard to general utterances which follow the initial utterance, the process is [almost the same as] similar to Embodiment 4. A series of processes, however, is slightly different as follows[.]:

10   1. specify the user utterance by the originating server 4020;

2. specify a specialized server to [cope with] process the specified utterance;

3. respond to the user by the expert agent implemented in the specialized server;

4. perform information search and display the search result;

15   5. encourage the user to input a new utterance.

[0317]   Fig. 57 shows the internal structure of the originating server 4020. Now [only] the differences from the originating server shown in Fig. 46 [is] are described.

[0318]   Each utterance has one corresponding file within the user utterance

20   collection 4038. The URL of a page to respond to the user utterance is described in each file. The content of the additional user utterance

collection 4039 is included in the user utterance collection 4038 although they are separately shown in Fig. 57 for the convenience of understanding.

[0319]   The URL detected in the user utterance collection 4038 or in the additional user utterance collection 4039 is transmitted to the browser of the

5   user terminal 4012 via the communication unit 4030. The browser then connects to the designated specialized server containing the page.

[0320]   The internal structure of the index file 4036 is [the same as] similar to the index file shown in Fig. 35. The internal structure of the user utterance collection 4038 is [the same as] similar to that shown in Fig. 47. The internal

10   description of the access information file 4046 is [the same as] similar to that shown in Fig. 48.

[0321]   Figs. 58 and 59 show the internal structure of an additional index file 4037 and the additional user utterance collection 4039, respectively. These components are included in the index file 4036 and the user utterance

15   collection 4038, respectively, but they are shown as independent components. The additional index file 4037 comprises an alphabet column 4200, a user utterance column 4202 and a file name column 4204. User utterance is sorted in [an] alphabetic [manner] order.

[0322]   The additional user utterance collection 4039 comprises a file name column 4204, a user utterance column 4202 and a page column 4220 to

20   indicate a specialized server to respond to the user. [When] In this example,

when the user utterance is "renewal", the page of the responsible specialized

server is "URLa203" and the combination of "renewal" and "URLa203"

composes the file f804. The additional index file 4037 and the additional user

utterance collection 4039 are linked through file names. For example, the

5   utterance "new arrival" is contained in the file f805 in the additional index

file 4037, as shown in Fig. 58, which is in turn associated with the file f805 in the

additional user utterance collection 4039, as shown in Fig. 59.

[0323]   Fig. 60 shows the internal structure of the gourmet server 4026. Now

only the difference from Fig. 50 is described.

10   [0324]   The specific-purpose processor 4076 in the page 64 of URLa1

performs information search in addition to the functions performed by its

counterpart in Fig. 50.

[0325]   A favorite register 4080 registers the gourmet agent, or any other

desired agent, as a favorite data 4082 upon request from the user. The favorite

15   register 4080 also registers the content of information the user wishes to

search, and the URLs of the [web] Web sites, as [the] favorite data 4082 upon

request. A character manager 4084 manages the attributes of the displayed

characters and changes the values in accordance with the treatment of the

characters by the user. The attributes are also stored as [the] favorite data

20   4082.

[0326]   Fig. 61 shows the internal structure of the <u>database storing the</u> favorite

data 4082. The favorite data 4082 is partitioned <u>in</u>to a user name column 4300,

a search object column 4302, a character attribute column 4304 and bookmark

columns 4312, 4318. The search object column 4302 stores the content of

5   information the user wishes to search <u>for</u>. The character attribute column 4304

comprises an age column 4306, a cheer column 4308 and an intelligence

column 4310, which are managed by the character manager 4084. These

attributes are [referred to] <u>referenced</u> when the characters are displayed on the

screen <u>of the display device</u>. The bookmark columns store the bookmarks user

10   [puts on web] <u>select for particular Web</u> sites. Each bookmark column contains

a URL column 4314 and a last view column 4316 which indicates when the user

made the last view on the URL.

[0327]   Fig. 62 shows the structure of a page stored in the agent action

library 4062. The page is used for information search<u>es</u>. A specific-purpose

15   processor 4076 of the URLa2 page 66 contains an information search unit 4077

to search <u>for</u> information requested by the user via the Internet 4014 and a

spontaneous search unit 4078 to start the search process spontaneously. The

information search unit 4077 and the spontaneous search unit 4078 acquire[s]

URL information and the content object stored in the favorite data 4082 when

20   [they start] the search <u>is initiated</u>. The spontaneous search unit 4078 decides

the search frequency referring to the attributes of a <u>display</u> character stored in

the favorite data 4082. The search result is presented to the user in the form of

a character utterance by a character displaying unit 4071 in an agent output unit 4070.

[0328]   The internal structure of the 4012 is [the same as] similar to that shown in Fig. 51. The initial screen of the 4012 is [the same as] similar to that shown in Fig. 52. The process shown in Figs. 53 and 54 is also performed in this embodiment. In the process, it is assumed that the user inputs "Teach me a good restaurant famous for Peking ravioli". The gourmet agent responds to the request and conducts the search. When the search is finished, the process jumps to a page to display the search result.

[0329]   Fig. 63 shows the screen 4150 displayed based on the page from the above example. On the screen, the titles 4170 of the [web] Web pages acquired by the information search unit 4077 are displayed. The favorite register 4080 registers the gourmet agent as a favorite character when the user clicks a register button 4180.

[0330]   Fig. 64 shows the screen 4150 in which the favorite register 4080 accepts the registration of a bookmark from the user. A bookmark is registered in the favorite data 4082 when the user fills the URL of a [web] selected Web site [he/she likes] in a URL column 4192 and clicks a register button 4190. A bookmark may be registered when the user clicks a bookmark register button (not shown) while [he/she views] viewing the [web] Web site.

[0331]   Fig. 65 shows the screen 4150 in which a favorite character registered by the user is displayed. A character house 4194 in which the favorite character lives is displayed. A search process is initiated when the user inputs "Do you have any arrivals?" as the user utterance is contained in the additional

5   utterance collection.

[0332]   Fig. 66 shows the screen in which Gourmet Agent 4160 presents the search result. Gourmet Agent 4160 tells that two sites among those the user have registered have been renewed. The last view column 4316 in Fig. 61 is referred to in order to select sites which were renewed after the last view.

10   Whether the registered [web] Web sites have been renewed or not may be checked when the user utterance relates to at least one of the [web] Web sites. Alternately, the registered [web] Web sites may be monitored periodically and renewed sites may be informed to the user when a user utterance is made.

[0333]   In the present embodiment, the favorite register 4080, the favorite

15   data 4082 and the character manager 4084 are implemented in a specialized server. These units, however, may be implemented in the originating server 4020 to be centrally managed thereby. The favorite data 4082 may be stored in the user terminal 4012. In this case, favorite characters may be designed as local agents to serve for the user in the user terminal 4012.

20   **[0334]**   Although the present invention has been described by way of exemplary embodiments, it should be understood that many changes and

substitutions may be made by those skilled in the art without departing from the

spirit and the scope of the present invention which is defined only by the

appended claims.

5